Vol. 906 Number 5

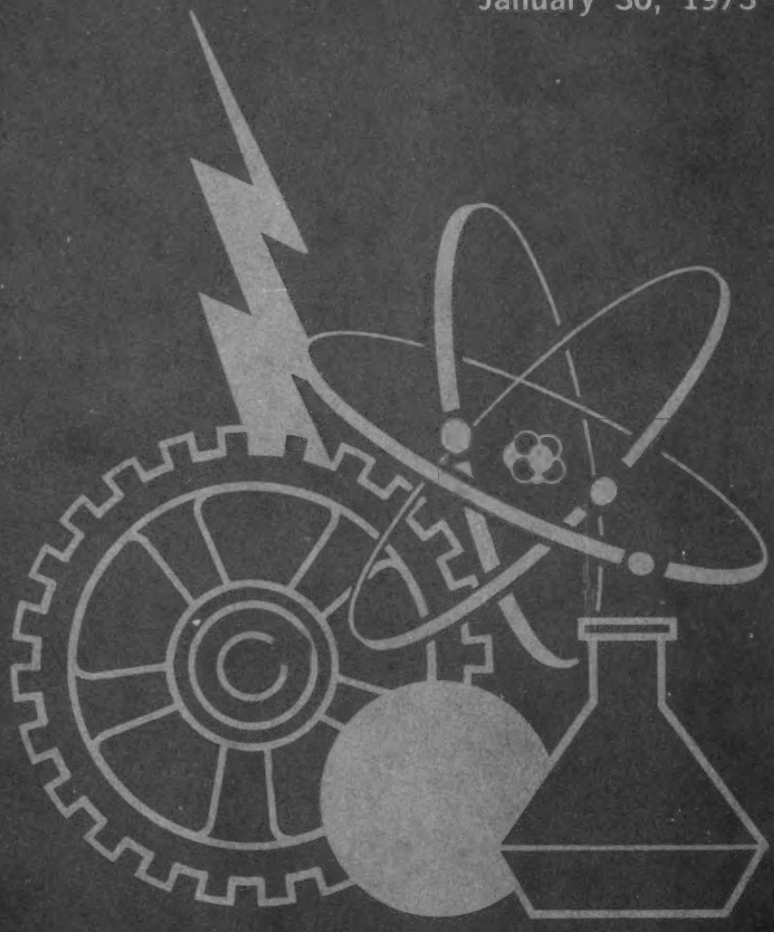
OFFICIAL GAZETTE

of the UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

January 30, 1973



U. S. DEPARTMENT OF COMMERCE

Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

January 30, 1973 Volume 906 Number 5

CONTENTS

	Page
Patents and Trademark Notices	
Registration to Practice	1508
Trademark Registration Treaty	1509
Patent Suits	1510
Patent Notices	
Certificates of Correction for the Week of January 30, 1973	1511
Dedication	1511
Disclaimers	1511
Disclaimer and Dedication	1511
Condition of Patent Applications	1512
Reissue Patents Granted	1513
Patents Granted	
General and Mechanical	1514
Chemical	1664
Electrical	1776
Design Patents Granted	1853
Index of Patentees	PI 1
Indices of Reissues and Designs	PI 46
Classification of	
Patents (Including Reissues)	PI 49
Designs	PI 52
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 53
Designs	PI 55

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $17.00 per annum, foreign mailing $4.25 additional; single copies 40 cents each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS or TRADEMARKS, price 15 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Registration to Practice

The following list contains the names of all applicants for registration to practice before the United States Patent Office who attained passing grades in the examination of September 12, 1972. Information tending to affect the eligibility of any of said applicants on moral or ethical grounds should be furnished the Commissioner of Patents on or before February 28, 1973.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

List of Applicants Who Passed the Examination for Registration to Practice Before the Patent Office Held September 12, 1972

A

Abruzzese, Peter A., 78A Woodside Ave., Roselle Park, N.J. 07204
Albin, Arnold L., 11 Robert Lennox Dr., Northport, N.Y. 11768
Ancel, Richard J., 140 N. Broadway, Irvington, N.Y. 10533
Anderson, Richard H., 831 S. Euclid, Villa Park, Ill. 60181
Anten, Lewis, 2201 Palmer Ave., New Rochelle, N.Y. 10801
Audet, Paul R., 40 Burritt Ave., South Norwalk, Conn. 06854

B

Baker, Joseph E., 1818 S. Western Ave., Suite 301, Los Angeles, Calif. 90006
Beam, Walter R., 24 Hilltop Drive, Chappaqua, N.Y. 10514
Becker, Stephen A., 15 Hardwicke Place, Rockville, Md. 20850
Bell, James R., 18624 Walkers Choice Rd., Gaithersburg, Md. 20760
Berka, George B., 1363 First Ave., New York, N.Y. 10021
Bigelow, Dana F., 2637 Shady Side Rd., Findley Lake, N.Y. 14736
Bingham, Robert, 1221 Foothill Dr., Salt Lake City, Utah 84108
Biren, Steven R., 207—35 27th Ave., Bayside, N.Y. 11360
Black, Jan M. S., 3514 Society Dr., Claymont, Del. 19703
Blance, Robert B., 46 Colony Dr., East Longmeadow, Mass. 01028
Bloomberg, Coe A., 243 Canterbury Rd., White Plains, N.Y. 10607
Borst, Stephen L., 71 W. Winspear Ave., Buffalo, N.Y. 14214
Brody, Frederick, 18B Putnam Green, Greenwich, Conn. 06830
Brunnell, Norman E., 73 Main St., Foxboro, Mass. 02035

C

Cagle, Stephen H., 1257 Jeremy Court, Cincinnati, Ohio 45240
Cannon, George J., 6 Whippletree Rd., Fairport, N.Y. 14450
Carpenter, Bruce N., P.O. Box 307, Ridgefield, Conn. 06877
Carpenter, John W., RD 1, Box 94, N. Mill Road, Cranbury, N.J. 08512
Cashman, George A., 12548 Densmore Ave., N., Seattle, Wash. 98133
Chafin, James H., 1401 Natl. Bank of Tulsa Bldg., Tulsa, Okla. 74103
Chernivec, Gerald F., 4159 White Bear Ave., White Bear Lake, Minn. 55110
Christoffel, Ivan, 117 Sherwood Drive, Hopewell, Va. 23860
Cohen, Gary J., 2442 Piedmont Ave., #20, Berkeley, Calif. 94704
Coulson, Virgil A., 1001 Trinity Court, Midland, Mich. 48640
Curfiss, Robert C., 2860 Madison Rd., Cincinnati, Ohio 45209

D

Darnell, Kenneth E., 8621 Georgia Ave., Silver Spring, Md. 20910
De Rosa, Frank J., 32—11 76th St., Jackson Heights, N.Y. 11370
Dilworth, Peter G., 431 Cross St., Westbury, N.Y. 11590

E

Emanuel, Peter M., Northgate Apts., #1141, Cranbury, N.J. 08512
Epstein, Robert L., 701B Cranbury Cross Rd., North Brunswick, N.J. 08902
Estrin, Barry, 511 Four Mile Rd., #1102, Alexandria, Va. 22305

F

Farkas, R. D., 772 Prospect St., Westfield, N.J. 07090
Fisher, Arthur W., III, 220 E. Madison, Suite 526, Tampa, Fla. 33602
Flickinger, Don J., 10037 N. 42nd Ave., Phoenix, Ariz. 85021
Friedman, Gilbert H., 5612 Via del Collado, Torrance, Calif. 90505
Frijouf, Robert F., 135 Chestnut Lane, #324, Richmond Heights, Ohio 44143
Frilette, Vincent J., 1228 Greenhill Rd., Morrisville, Pa. 19067

G

Galahad, Giles, 3812 McClure Ave., Pittsburgh, Pa. 15212
Gibbons, A. Joseph, 14429 Drexmore Rd., Shaker Heights, Ohio 44120
Gilliam, Frank D., 4312 Point View Court, La Mesa, Calif. 92041
Gilliland, Alan D., 50 Groveland Terr., #206, Minneapolis, Minn. 55403
Glober, George E., Jr., 3601 Allen Pkwy., #116, Houston, Tex. 77019
Goodman, Alfred N., 301 C St., S.W., #314, Washington, D.C. 20024
Gray, Richard O., Jr., 1005 W. 19th St., Broadview, Ill. 60153
Green, Geoffrey D., 237 Varsity Ave., Princeton, N.J. 08540
Greenman, Jeffrey M., 100–7 Manhattan Ave., #2104, Union City, N.J. 07087
Gross, Karl H., Plumbrook Rd., Katonah, N.Y. 10536
Groves, D. Arlon, 1 Shell Plaza, Houston, Tex. 77002

H

Halpert, David H., 1043 Cambridge St., #57, Cambridge, Mass. 02138
Hanscom, Douglas R., 5601 Seminary Rd., #2005N, Falls Church, Va. 22041
Hanway, John R., 5049 Northlawn Dr., Murrysville, Pa. 15668
Hardeway, John B., III, 113 Concord Rd., Oak Ridge, Tenn. 37830
Harding, Wayne M., 4211 Holland, #208, Dallas, Tex. 75219
Hart, Leslie J., 130 Colonial Pkwy., Yonkers, N.Y. 10710
Hayman, Edward A., 1220 Keith Bldg., Cleveland, Ohio. 44115
Hecht, Louis A., 20 N. Wacker Dr., Chicago, Ill. 60606
Hein, William E., 1409 E. 16th St., Loveland, Colo. 80537
Hill, Jefferson B., 504 A St., S.E., Washington, D.C. 20003
Hofer, Ronald L., 3278 Rocker #8, Cincinnati, Ohio 45239
Hoffman, Charles R., 2181 E. Broadmor Dr., Tempe, Ariz. 85282
Hoffman, Frank P., 1 Concord Pl., Morris Plains, N.J. 07950
Hook, Fred E., 1107 Harville Rd., Duncan, Okla. 73553
Hormann, Karl H., Polaroid Corp., 730 Main St., Cambridge, Mass. 02139

J

Johnson, Bruce A., Route 1, Siren, Wis. 54872
Johnson, James W., Jr., 1330 North Carolina Ave., N.E., Washington, D.C. 20002
Jones, Joseph A., 824 N. Graham Ave., Indianapolis, Ind. 46219

K

Kirschnik, James L., 4125 Cherokee Dr., Brookfield, Wis. 53005
Klawitter, Andrew L., 607 N. Lafayette Blvd., South Bend, Ind. 46601
Klepac, Glenn E., 340 Ridge Ave., Evanston, Ill. 60202
Koppel, Richard S., Manchester House #5, Beverly Commons, Beverly, Mass. 01915
Korrey, Dave M., 7400 S. Broadway, Littleton, Colo. 80122
Kosman, Evelyn R., 2728 Hampton Rd., Rocky River, Ohio 44116

L

Landis, Martin S., 535 Clark St., Westfield, N.J. 07090
Landmeier, Allen Lee, 309 S. 8th St., St. Charles, Ill. 60174
Leedom, Charles M., Jr., 1600 S. Eads St., #827N, Arlington, Va. 22202
Lehrer, Norman E., 8316 Tobin Rd., #12, Annandale, Va. 22003
Lennon, Michael J., 149—84 255th St., Rosedale, N.Y. 11422
Lewandowski, Thomas P., 27435 Sutherland, Southfield, Mich. 48076
Lewis, Jon M., 63 Georgetown East, Greensburg, Pa. 15601

M

Macovski, Albert, 4100 Mackay Dr., Palo Alto, Calif. 94306
Mallinkrodt, Robert R., 2535 E. 6200 S., Salt Lake City, Utah 84121
Marger, Jerome S., 400 Oregon Natl. Bldg., 610 S.W. Alder, Portland, Oreg. 97205
Massung, Howard G., 110 Clenora Dr., Coraopolis, Pa. 15108
McCaslin, Delbert E., 5719 Wilson Lane, Bethesda, Md. 20034
McClenny, Carl O., 6154 Miller's Way, Houston, Tex. 77027
McClung, Charles D., W. 1216 Warn Way, Spokane, Wash. 99208
McGlynn, Daniel R., 329 84th St., Brooklyn, N.Y. 11209
McKee, James W., 471–A Clearview Dr., Euclid, Ohio 44123
Melkiejohn, Paul T., 2702 Wisconsin Ave., #310, Washington, D.C. 20007
Melton, Stuart L., 7525 Republic Ct., #103, Alexandria, Va. 22306
Michals, William J., 46 Maple Stream Rd., Hightstown, N.J. 08520
Middleton, James B., 1620 Gas Light Tower, Atlanta, Ga. 30303
Miller, Wendell E., 1907 Crescent Dr., Warsaw, Ind. 46580
Mitchell, John B., 2400 Wanda Way, Reston, Va. 22070
Mohl, Douglas C., 5484 Bahama Terr. #8, Cincinnati, Ohio 45223
Moore, Carl E., 6150 N. Lawndale, Chicago, Ill. 60659
Morgan, DeWitt M., 140 Burrows Hills Dr., Rochester, N.Y. 14625
Morrow, John A., 138 Greenleaf Meadows, Rochester, N.Y. 14612
Myers, Richard L., 26536 Morene Dr., Mission Viejo, Calif. 92675

N

Nawalanic, Frank J., 4935 Donald Ave., Richmond Heights, Ohio 44143
Nelson, John R., 180 Connestoga St., Windsor, Conn. 06095

O

Oldham, Robert L., 1146 Chestnut Blvd., Cuyahoga Falls, Ohio 44221
Olsen, Kenneth, 322 94th St., Brooklyn, N.Y. 11209

P

Parkhurst, Todd S., Olson, Trexler et al., 141 W. Jackson Blvd., Chicago, Ill. 60604
Peterson, Richard E., Limbach, Limbach & Sutton, 3000 Ferry Bldg., San Francisco, Calif. 94111
Pollen, Kalman, 96 Prescott, Apt. 9, Cambridge, Mass. 02148
Preist, Lee-Louise, 7116 Saroni Dr., Oakland, Calif. 94611
Priem, Kenneth R., 11803 N. Kensington, Houston, Tex. 77071

R

Rady, Arnold I., 41 Newkirk Ave., East Rockaway, N.Y. 11518
Resendez, Ignacio, 11605 Riviera Rd., N.E., Albuquerque, N. Mex. 87111
Revis, Stephen Eli, 550 Burnside Ave., East Hartford, Conn. 06108
Rice, Robert O., 1587 Old Hickory Lane, St. Joseph, Mich. 49085
Richter, Paul S., 1140 Connecticut Ave., N.W., Washington, D.C. 20036
Rifkin, William T., 1000 Georgia-Pacific Bldg., Portland, Oreg. 97204
Rosen, Clifford N., 101 Harbor Dr., Hampton, Va. 23361
Rothman, Richard B., 1600 S. Eads, #238N, Arlington, Va. 22202
Ruch, Joseph J., Jr., 2425 S. Fern St., Arlington, Va. 22202

S

Salada, Maurice R., 10 Piermont Pl., Piermont, N.Y. 10968
Sand, Michael, 2883 Chaucer Dr., N.E., Canton, Ohio 44721
Savitz, Lesley M., 440 25th St., N.W., #2015, Washington, D.C. 20037
Schlott, Richard J., 415 S. Evergreen Ave., Arlington Heights, Ill. 60005
Schlyner, Lyle J., 610 S. Adria St., Anaheim, Calif. 92802
Scott, Watson T., 9311 Chaunte Dr., Bethesda, Md. 20014
Selinger, Jerry R., 5976-301 Westchester Park Dr., College Park, Md. 20740
Shear, Richard H., 24 Prairie Rose Ct., Gaithersburg, Md. 20760
Sherman, Robert L., 214—09 14th Ave., Bayside, N.Y. 11360
17055
Sigler, Robert M. Jr., 655 Kirts, A-204, Troy, Mich. 48084
Silberberg, Charles, 5375 Duke St., #116, Alexandria, Va. 22304
Slusky, Ronald D., 60 Manor Crescent, New Brunswick, N.J. 08901
Smith, William W., 9200 Stenton Ave., Philadelphia, Pa. 19118
Snee, Charles E., III, 3039 Q St., N.W. #5, Washington, D.C. 20007
Soderling, Gail S., P.O. Box 33427, St. Paul, Minn. 55133
Sommer, Peter K., 4409 E. Overlook Dr., Williamsville, N.Y. 14221
Stanfield, Carol K., Stratford Apts., D-8, Wilmington, Del. 19810
Stanley, Henry M., 215 Riverside Ave., Ben Lomond, Calif. 95005
Steinberg, Richard A., 1805 Columbia Pike, Arlington, Va. 22204
Stemwedel, John A., 53 W. Jackson Blvd., Chicago, Ill. 60604
Stoner, Douglas E., 55 Dinsmore Ave., Apt. 305, Framingham, Mass. 01701
Sullivan, Dennis K., International Harvester Co., 401 N. Michigan, Chicago, Ill. 60611
Supnik, Paul D., 11617 Gorham, #34, Los Angeles, Calif. 90049
Suter, Stuart R., Smith Kline & French Labs., 1500 Spring Garden St., Philadelphia, Pa. 19101

T

Teacher, Paul T., 175—45 88th Ave., #2E, Jamaica, N.Y. 11432
Timmons, Stephen D., 7633 Chadwick, Prairie Village, Kans. 66208
Tomsa, Stanley J., 260 E. Chestnut, #1710, Chicago, Ill. 60611
Troxell, Bruce H., 6304 Wingate St., Alexandria, Va. 22312
Troy, Frank J., Sr., 28 Sweetbriar Lane, Levittown, Pa. 19055
Turner, Terrance A., 420 River Rd., #G4, Chatham, N.J. 07928

U

Uebler, Ernest A., R.D. #3, Newark, Del. 19711

W

Waite, Tom, Suite 1010 Union Bank Plaza, 15233 Ventura Blvd., Sherman Oaks, Calif. 91403
Wallor, Robert K., 22555 Lark Spring Terr., Diamond Bar, Calif. 91765
Walsh, Robert A., 237 High St., Winchester, Mass. 01890
Ward, Robert M., 6011 Forest View, Lisle, Ill. 60532
Weakley, Wallace E., 10909 Trafton Dr., Upper Marlboro, Md. 20870
Weber, Ray L., 676 Reed Ave., Akron, Ohio 44306
Weinrieb, Steven, 13832 Bethpage Lane, Silver Spring, Md. 20906
Welsh, Thomas M., 2001 Beltra Pl., Costa Mesa, Calif. 92626
Wesley, William M., 1016 W. Glentrail, Elk Grove, Ill. 60007
White, Gerald K., 364 5th St., Beaver, Pa. 15009
Wilford, Andrew M., 39 S. Munn Ave., East Orange, N.J. 07018
Williams, Thomas H., 168 E. Creek Dr., Menlo Park, Calif. 94025
Wilson, Bruce H., 40 Division St., Hudson, Ohio 44236
Winkelman, John D., 1004 Standard Plaza, Portland, Oreg. 97204
Wobensmith, Zachary T., III, 412 Lafayette Bldg., 5th and Chestnut Sts., Philadelphia, Pa. 19106

Y

Yetter, Herry J., 6174 Seiler Drive, Cincinnati, Ohio 45239

The following list contains the names of persons applying for registration to practice before the United States Patent Office either on the basis of 4 years or more service in the Examining Corps or under Rule 341(e) of the "Rules of Practice of the United States Patent Office in Patent Cases." Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds should be furnished the Commissioner of Patents on or before February 28, 1973.

Bovee, Warren R., 4901 Seminary Rd., #314, Alexandria, Va. 22311
Church, Robert W., 12314 Welling Lane, Bowie, Md. 20715
Cohen, David L., 717 S. 19th St., Arlington, Va. 22202
Grimaldi, Alan M., 15 Silver Kettle Court, Gaithersburg, Md. 20760
Ross, John W., 1 Trevor Cres., Ottawa, Ontario, Canada
Sherman, Robert L., 214—09 14th Ave., Bayside, N.Y. 11360
Wai, Stanley A., 8005 Orange Plank Dr., Springfield, Va. 22153

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Trademark Registration Treaty

In December 1972, the last of a series of six international conferences of governmental, inter-governmental, and private experts was held for the purpose of preparing draft articles and regulations of the Trademark Registration Treaty (TRT) for consideration at the Diplomatic Conference which will be convened in Vienna, Austria, on May 17, 1973.

The Patent Office is most interested in receiving comments from the public expressing their views on the Treaty in order to assist the United States in developing the best overall approach to the Vienna negotiations.

In order to insure that we will receive the benefit of informed judgments of trademark owners, attorneys, and other interested persons on the proposed Treaty documents, copies of Patent Office studies and other materials concerning the Treaty will be made available to interested persons or associations on their request.

The Patent Office will make every effort in responding to requests to provide materials which will meet the particular needs of individuals and associations. It is our intention to provide the public with information which is factual and as complete and balanced as possible in regard to the Treaty and the issues concerning it which are of interest to the United States. Our objective is to assist interested businessmen and trademark practitioners in formulating their own views on the Treaty and on the relevant issues.

The final conference text of the articles of the proposed Treaty was published in the OFFICIAL GAZETTE of September 19, 1972. It is planned to publish the conference text of the regulations as soon as possible (probably late in February 1973) after its release by the World Intellectual Property Organization (WIPO). As previously announced, final comments on these documents should be submitted to the Patent Office prior to April 6, 1973.

Requests for information concerning the Treaty and final comments should be addressed to:

Commissioner of Patents
Washington, D.C. 20231

ROBERT GOTTSCHALK,
Commissioner of Patents.

Jan. 4, 1973

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,750,055, J. D. Huffines, REFUSE COMPRESSOR MECHANISM FOR VEHICLES, filed Aug. 24, 1971, D.C., W.D. Pa. (Pittsburgh), Doc. C.A. 71–789, *James Donle Huffines* v. *Thiele, Inc., W. L. Thiele, R. T. Thiele and Glenn Thiele.* Consent judgment; order entered directing that the defendants, each of them, have infringed said U.S. patent, parties have entered into a compromise and agreement of the issues and causes of action herein raised and relating to said Letters Patent, Aug. 15, 1972.

2,804,401, B. A. Cousino, MAGNETIC SOUND TAPE; [273,066 (Japanese); 660,361 (Canadian)], filed May 25, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1316, *Faraday, Inc. etc.* v. *TDK Electronics Corp. and TDK Electronics Co., Ltd.* Same, filed May 25, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1317, *Faraday, Inc.* v. *Sony Corp. of America.* Same, filed May 25, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c1318, *Faraday, Inc.* v. *Hitachi Maxell, Ltd.*

2,926,116, G. I. Keim, WET STRENGTH PAPER AND METHOD OF MAKING SAME; 2,926,154, same, CATIONIC THERMOSETTING POLYAMIDE - EPICHLOROHYDRIN RESINS AND PROCESS OF MAKING SAME; filed Aug. 16, 1972, D.C.N.J. (Trenton), Doc. C–1414–72, *Hercules, Incorporated* v. *Borden, Inc.*

2,926,154. (See 2,926,116.)

3,008,190, R. H. Mesinger, METHOD AND APPARATUS FOR FORMING CYCLE SADDLE COVERS; 3,077,363, same, CYCLE SADDLE COVERS, filed Sept. 1, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1400–C–CF, *Robert H. Mesinger et al.* v. *Western Auto Supply Co. et al.*

3,077,363. (See 3,008,190.)

3,157,037, Nebel and Nebel, RUN RESISTANT KNITTED STOCKINGS; 3,430,463, same, METHOD AND APPARATUS FOR MAKING RUN RESISTANT KNITTED FABRIC, filed Aug. 30, 1972, D.C. M.D.N.C. (Greensboro), Doc. C–255–G–72, *Hanes Corporation V. Leath, McCarthy & Maynard, Inc.*

3,293,072, Doolittle and Ettre, CERAMIC-METALLIZING TAPE, filed Aug. 24, 1972, D.C., E.D. Mich. (Detroit), Doc. 38805, *Vitta Corp.* v. *Alloy Metals, Inc.*

3,426,098, Meyer, Sheffer and Zalewski, POLYESTER-POLYIMIDE WIRE ENAMEL, filed Aug. 28, 1972, D.C., N.D.N.Y. (Utica), Doc. 72–CV–395, *Schenectady Chemicals, Inc.* v. *General Electric Company.*

3,430,463. (See 3,157,037.)

3,452,387, Jerila and Holmes, CLOSING DEVICE FOR DOORS, filed Aug. 30, 1972, D.C., N.D. Ill. (Freeport), Doc. 72c43, *Ajax Hardware Corporation* v. *National Lock, Division of Keystone Consolidated Industries.*

3,462,045, I. J. Markowitz, SAFETY AEROSOL COVER CAP, filed Aug. 18, 1972, D.C., S.D.N.Y., Doc. 72–C–3552, *Stem Development Corp.* v. *Continental Can Company, Inc. and White Cap Division of Continental Can Co., Inc.*

3,464,424, F. D. Buzzelli, METHOD FOR RETAINING HAIR, filed Jan. 12, 1971, D.C., E.D. Mich. (Detroit), Doc. 35919, *Frank Buzzelli* v. *Minnesota Mining and Manufacturing Co.* Granting defendant's motion for summary judgment and that plaintiff's patent is invalid and for dismissal with prejudice, Aug. 22, 1972.

3,511,291, B. E. Ragan, RENEWED HEAVY DUTY TIRE WITH A LUGGED TREAD THEREON; Re. 27,006, same, METHOD OF BUILDING A LUGGED TREAD ON A HEAVY DUTY TIRE, filed Aug. 31, 1972, D.C., N.D. Ga. (Atlanta), Doc. 17093, *Brad Ragan, Inc.* v. *Edwards-Warren Tire Company, Inc.*

3,540,756, Stout and Brunk, AXLED VEHICLE SUPPORT FRAME ASSEMBLY, filed Aug. 29, 1972, D.C. Kans. (Wichita,) Doc. W–4918, *Stoutco, Inc.* v. *York Manufacturing Co., Inc.*

3,584,402, J. J. Silverman, SANDAL FOR FOOT CAST, filed May 2, 1972, D.C., E.D. Mich. (Detroit), Doc. 38223, *Ortho Industries, Inc.* v. *S. H. Camp and Company.* Consent judgment for permanent injunction, Aug. 23, 1972.

3,596,303, Kelley and Steinberg, DOCKBOARD, filed Aug. 23, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1346–C–JE, *Kelley Co., Inc.* v. *Conner Warehouse & Dock Equipment Co., Inc. et al.*

3,622,980, F. R. Elledge, Jr., DIRECTIONAL WARNING SYSTEM, filed Apr. 20, 1972, D.C., S.D. Ohio (Cincinnati), Doc. 8380, *Casell Co., Inc.* v. *Baader-Brown Mfg. Co.* Stipulation of voluntary dismissal, Aug. 31, 1972.

Re. 27,006. (See 3,511,291.)

273,066 (Japanese). (See 2,804,401.)

660,361 (Canadian). (See 2,804,401.)

Certificates of Correction for the Week of Jan. 30, 1973

3,513,728	3,675,642	3,685,981
3,551,284	3,677,699	3,686,150
3,586,063	3,678,817	3,686,254
3,592,684	3,678,979	3,686,340
3,614,872	3,679,016	3,686,349
3,618,745	3,679,057	3,686,449
3,620,520	3,679,420	3,686,578
3,628,521	3,679,505	3,686,921
3,630,246	3,679,555	3,686,944
3,638,636	3,679,746	3,687,084
3,640,701	3,679,782	3,687,183
3,643,517	3,679,801	3,687,646
3,646,971	3,680,196	3,687,756
3,647,775	3,680,497	3,687,759
3,647,895	3,680,713	3,687,764
3,649,563	3,680,728	3,687,768
3,649,814	3,681,091	3,687,879
3,652,554	3,681,331	3,687,887
3,652,762	3,681,882	3,688,159
3,655,638	3,682,174	3,688,166
3,655,771	3,682,610	3,688,466
3,656,084	3,682,820	3,688,824
3,656,814	3,682,905	3,688,893
3,656,924	3,683,017	3,688,965
3,657,173	3,683,037	3,689,529
3,666,178	3,683,343	3,689,632
3,667,710	3,683,510	3,689,645
3,671,030	3,683,730	3,690,836
3,671,086	3,684,296	3,690,964
3,671,314	3,684,421	3,691,099
3,671,645	3,684,641	3,691,113
3,673,026	3,684,687	3,691,185
3,673,355	3,684,883	3,691,239
3,673,655	3,685,051	3,691,380
3,673,736	3,685,287	3,691,873
3,673,837	3,685,354	3,691,995
3,673,995	3,685,733	3,692,096
3,674,583	3,685,755	3,692,228
3,674,607	3,685,806	3,692,968

Dedication

3,056,684.—*Stanley L. Lopato,* Ladue, and *William R. Keithler,* Kirkwood, Mo. PROTECTIVE COATINGS. Patent dated Oct. 2, 1962. Dedication filed Oct. 16, 1972, by the assignee, *Carboline Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimers

3,290,977.—*Clarence C. Brestel,* Hamilton County, Ohio and *Howard R. Maschinot,* Erlanger, Ky. DIE CUTTING MACHINES FOR LABELS AND THE LIKE. Patent dated Dec. 13, 1966. Disclaimer filed July 31, 1972, by the assignee, *The Printing Machinery Company.*

Hereby enters this disclaimer to claims 1 through 10 of said patent.

3,364,223.—*Howard Johnston,* Walnut Creek, Calif. HALOGENATED THIOPYRIDINES. Patent dated Jan. 16, 1968. Disclaimer filed Oct. 20, 1972, by the assignee, *The Dow Chemical Company.*

Hereby enters this disclaimer to claim 1 of said patent.

3,404,061.—*James H. Shane,* Acton, *Robert J. Russell,* Framingham, and *Raymond A. Bochman,* North Reading, Mass. FLEXIBLE GRAPHITE MATERIAL OF EXPANDED PARTICLES COMPRESSED TOGETHER. Patent dated Oct. 1, 1968. Disclaimer filed Oct. 12, 1972, by the assignee, *Union Carbide Corporation.*

Hereby enters this disclaimer to claims 1–4 and 11–15 of said patent.

3,628,186.—*Arthur Ashkin,* Rumson, and *John E. Bjorkholm,* Middletown, N.J. PARAMETRIC OSCILLATOR WITH NONRESONANT SIGNAL. Patent dated Dec. 14, 1971. Disclaimer filed July 17, 1972, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claim 2 of said patent.

3,664,360.—*Joseph Kenneth Royle,* Bakewell, *John Grant,* Risley, and *Jack Alexander Golder,* Lower Walton, England. FLUID FLOW CONTROL DEVICES. Patent dated May 23, 1972. Disclaimer filed Oct. 31, 1972, by the assignee, *United Kingdom Atomic Energy Authority.*

Hereby enters this disclaimer to claims 1 and 3 of said patent.

3,675,900.—*Charles D. Barron,* Huntington Beach, *Earl A. Peterson,* Long Beach, *Gary K. Stark,* Buena Park, and *Carl A. Wilms,* La Habra, Calif. MOTION COMPENSATING HOIST. Patent dated July 11, 1972. Disclaimer filed June 12, 1972, by the assignee, *Byron Jackson, Inc.*

Hereby disclaims the portion of the term of the patent subsequent to Mar. 14, 1989.

3,684,903.—*Tegze Haraszti,* Heilbronn, Germany. DYNAMIC CIRCUIT ARRANGEMENTS. Patent dated Aug. 15, 1972. Disclaimer filed Oct. 31, 1972, by the assignee, *Licentia, Patent-Verwaltungs-G.m.b.H.*

Hereby disclaims the portion of the term of the patent subsequent to Aug. 8, 1989.

Disclaimer and Dedication

3,668,315.—*James O. Heitzman,* Fullerton, Calif. RECEIVER TIMING AND SYNCHRONIZATION SYSTEM. Patent dated June 6, 1972. Disclaimer and dedication filed July 17, 1972, by the assignee, *Hughes Aircraft Company.*

Hereby disclaims all claims of said patent and dedicates to the Public the entire term of said patent.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 9, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-02-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-12-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-01-72
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-17-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-06-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-14-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	4-29-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-01-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-01-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-22-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-04-71

Expiration of patents: The patents within the range of numbers indicated below expire during January 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,728,913 to 2,733,438, inclusive
Plant Patents..... Numbers 1,442 to 1,455, inclusive

REISSUES

JANUARY 30, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,568

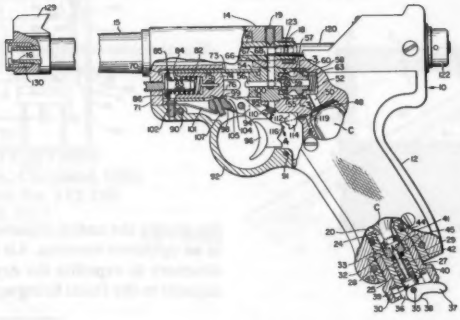
GAS-POWERED PISTOL

John F. Vadas, Webster, and Donald A. Desrochers, Rochester, N.Y., by Crosman Arms Company, Inc., Fairport, N.Y., assignee

Original No. 3,527,194, dated Sept. 8, 1970, Ser. No. 624,435, Mar. 20, 1967. Application for reissue Mar. 1, 1972, Ser. No. 230,774

Int. Cl. F41b *11/06*

U.S. Cl. 124—11 R **11 Claims**



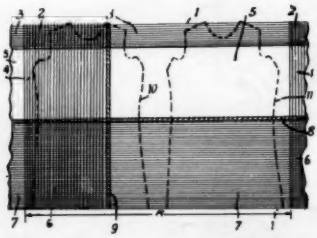
The pistol hand grip has a chamber holding a gas cartridge. This chamber is connected to a valve chamber. The valve chamber is connected to the gun barrel to deliver the gas behind a projectile therein. When the valve is seated it stops flow of gas to the barrel. A spring-activated hammer aligned with the valve, when released, opens the valve. A primary sear pivoted on the trigger and spring-pressed to holding position, holds the hammer cocked. A secondary sear integral with the trigger prevents accidental firing until the trigger is positively tripped. A screw permits fine adjustment of the primary sear.

PATENTS

GRANTED JANUARY 30, 1973

GENERAL AND MECHANICAL

3,713,174
METHOD OF ARTICLES OF CLOTHING
Jean-Claude Boussac, 8 rue Bertic Albrecht, Paris, France
Filed July 20, 1967, Ser. No. 654,917
Int. Cl. A41d *1/22*
U.S. Cl. 2—74 **6 Claims**



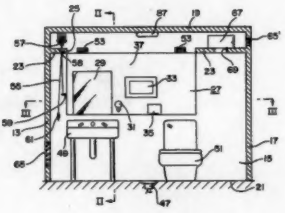
The new kind of dress is essentially characterized by the fact that the dress is made of a fabric having stripes and/or lines, of various colors, which provide the various effects corresponding to all the characteristic elements of the pattern of the dress and are obtained by means of the fabric itself and without any interruption of continuity over the shoe of its surface.

3,713,175
METAL ALLOY CARDIOVASCULAR IMPLANT DEVICE
Sidney Weisman, West Caldwell, N.J., assignor to Howmedica, Inc., Rutherford, N.J.
Filed Nov. 19, 1970, Ser. No. 91,144
Int. Cl. A61f *1/22, 1/24*
U.S. Cl. 3—1 **7 Claims**

A prosthetic device for surgical implantation within the cardiovascular system of an animal is constructed of a cobalt-chromium-tungsten-nickel-molybdenum alloy. The device is characterized in that it is non-thrombotic and substantially non-reactive with the chemicals found within the animal when implanted therein.

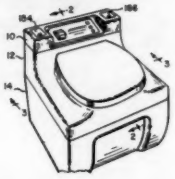
3,713,176
SELF-CLEANING RESTROOM
Richard R. Stock, 4005 Roxbury Road, Jackson, Miss.
Filed Dec. 27, 1971, Ser. No. 211,959
Int. Cl. A47k *17/00*
U.S. Cl. 4—1 **12 Claims**

A self-cleaning restroom including a panel swingably mounted therein between a normally vertical position and a cleaning or horizontal position. The front side of the panel has mounted thereto dispensers for dispensing the usual expendables commonly found in a restroom. The reverse side of the panel includes a group of nozzles suitably arranged thereon and communicated with a variety of fluids each of which is suitably programmed to emanate from the nozzle in a predetermined sequence for spray cleaning and disinfecting the entire restroom. Moving the panel to the cleaning position places the dispenser in a remote location where they remain



dry during the entire sequence and suitably places the nozzles in an optimum location. Air is forced through suitable venting structure to expedite the drying process of the restroom subsequent to the fluids being sprayed therein.

3,713,177
MARINE TOILET
Wesley M. Tufts, Holliston, and James H. Albertassi, Braintree, both of Mass., assignors to Nantron Corp., Braintree, Mass.
Filed Aug. 30, 1971, Ser. No. 176,010
Int. Cl. E03d *11/10, 11/11*
U.S. Cl. 4—95 **16 Claims**



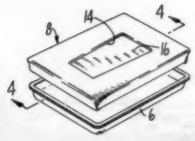
A marine toilet having a bowl connected by a trap to a macerator which in turn is connected to a tank, a pump for effecting flow of the intake and discharge fluids and a control circuit provided with switch means, one of which disables the circuit so that the unit cannot be used in areas where discharge is unlawful and another of which is operable in one position to condition the unit for flushing followed by decontamination and automatic discharge and in another position for washing and discharge.

During the flush mode, clear water is delivered to the bowl to effect flushing, the effluent is passed through a macerator for reduction to particle size and discharged into a tank together with a decontaminant and deoderant, where it is held for a predetermined period to effect decontamination and then is discharged through an overboard line. During the wash mode, clear water is delivered directly to the tank, flung about therein to effect scrubbing and cleaning of the interior of the tank and then discharged from the tank. There are sensors for disabling the control circuit in the event that the tank is filled to capacity and/or the decontaminant agent is depleted.

3,713,178
DISPOSABLE BEDPAN

Gertrude E. Mallette, Orinda, Calif., assignor to Leonard Barnard, Piedmont, Calif.

Filed Aug. 2, 1971, Ser. No. 168,208
Int. Cl. A61g 9/00
U.S. Cl. 4—112 2 Claims

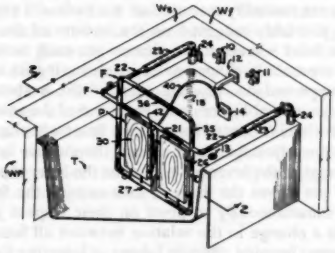


A completely disposable bedpan is provided which is spill-proof, drip-proof and odorless. It is lightweight and easy to handle.

3,713,179
BATH TUB SAFETY DIVIDER

Stephen Dubiel, 12210 Detroit Ave., Cleveland, Ohio

Filed Feb. 3, 1971, Ser. No. 112,150
Int. Cl. A47k 3/12
U.S. Cl. 4—185 6 Claims

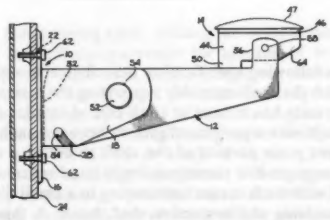


As a bath tub accessory, a transverse vertical panel carried on an environment-anchored, length-adjustable horizontal frame and thereby providing a foot abutment selectably shortening the tub to the user's size and so minimize risk, to aged, infant, debilitated or handicapped users, of drowning and other dangers attendant upon possibility of slipping supine in the tub; with inclusion also of rail structure and of an emergency drain actuator disposed conveniently to the shortened space.

3,713,180
FOOT SUPPORT FOR SHOWER BATHS

Peter Martin, 20800 Roscoe Bend, Canoga Park, Calif.

Filed Dec. 18, 1970, Ser. No. 99,581
Int. Cl. A47k 3/12
U.S. Cl. 4—185 6 Claims

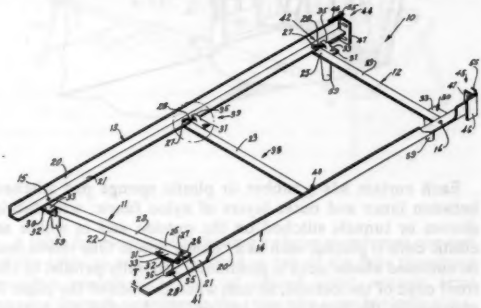


Herein is described a foot support device adapted for mounting to the wall of a shower to facilitate the washing and drying of feet and legs. The disclosed embodiment comprises a mounting plate and hinge assembly with a support bar pivotally connected to the hinge assembly for rotational movement between a position of use and a storage position. A foot rest member, having an arched upper surface of resilient material, is pivotally connected to the outer end of the support bar.

3,713,181
BED FRAME

Oscar Hougland, Winchester, Ky., assignor to Leggett & Platt Incorporated, Carthage, Mo.

Filed May 7, 1971, Ser. No. 141,272
Int. Cl. A47c 19/12
U.S. Cl. 5—176 R 4 Claims

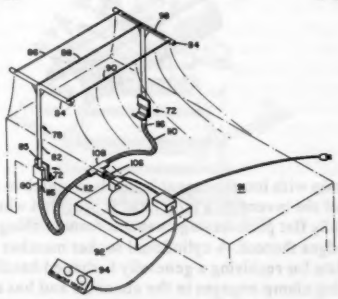


A nonadjustable Hollywood bed frame in which the frame elements are formed from angle iron. The side rails and cross rails are so interconnected that the frame may be assembled and disassembled without the use of any screws, nuts, or bolts. To that end the cross rails are detachably connected to the side rails by either a bayonet and hook type connector or a lockable headed rivet and keyway type connector. A headboard may be connected to the end of the side rails in any of three different modes by a novel hinge connection arrangement between the headboard and the side rails.

3,713,182
BEDCLOTHES ELEVATOR AND BED WARMER

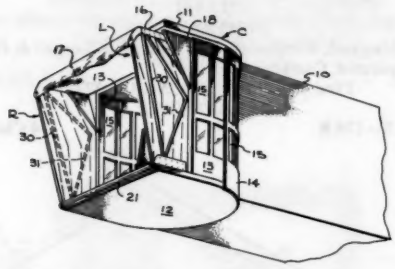
Hugh E. McNeal, 9124 Cambon Court, Spring Valley, Calif.

Filed May 26, 1971, Ser. No. 147,112
Int. Cl. A47c 21/00
U.S. Cl. 5—319 2 Claims



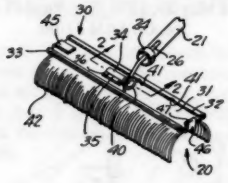
An apparatus for elevating bedclothes above a bed and for warming the air under the bedclothes. Two hollow, tubular rigid arms are vertically mounted on either side of a bed; one or more flexible, resilient lines span the free ends of the rigid arms to form a structure over which the bedclothes drape. The flexible lines are removable and adjustable. Under the bed is a small air blower with a heating unit. The air blower discharges heated air into the bed through the passages formed in the hollow, tubular rigid arms of the bedclothes elevator.

3,713,183
CURTAINS FOR AIRPORT RAMPS
Walter R. Belisle, 6027 Esters Court, Arvada, Colo.
Filed Aug. 4, 1971, Ser. No. 168,850
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **13 Claims**



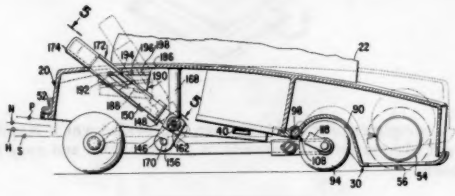
Each curtain has a rubber or plastic sponge pad stitched between inner and outer layers of nylon fabric, with fabric sleeves or tunnels stitched on the outside and in which an elastic cord is placed, such as a "bungy" cord. One sleeve and its enclosed elastic cord is positioned generally parallel to the front edge of the curtain, so that when the side of the plane is engaged by the front of the curtain, the front of the curtain will fold and gather against the plane. The other cord and its sleeve are arranged angularly, extending from points adjacent the ends of the front cord and a point adjacent the rear edge of the curtain at its greatest width, with the rear cord also stretching the curtain.

3,713,184
MOP WITH INTERCHANGEABLE HEADS
Ragnvald G. Leland, 2334 West 241st Street, Lomita, Calif.
Filed Sept. 24, 1971, Ser. No. 183,518
Int. Cl. A47l *13/252, 13/255*; B25g *3/38*
U.S. Cl. 15—229 B **7 Claims**



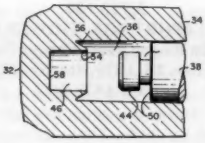
A mop with interchangeable heads in which in the preferred form of the invention a mop head is provided which includes a generally flat plate having channels formed along the opposite side edges thereof. A cylindrical socket member is secured to the plate for receiving a generally L-shaped handle connector. A spring clamp engages in the channels and has a central portion for removably retaining the L-shaped handle member in the cylindrical socket. The spring member is movable to permit the handle member to be removed from the socket so it may be attached to a different mop head. The mop is secured to the mop head by means of a resilient bar having an elongate hook on one end for engaging over the end of the plate and a short snap hook on the other end for engaging over the other end of the plate. The L-shaped handle member has one end inserted in a recess in the handle and is retained therein by a slip ring.

3,713,185
VACUUM CLEANER WITH NOZZLE HEIGHT ADJUSTING MECHANISM
Earl R. Clowers, and Walter G. Azelkas, both of Anderson, S.C., assignors to The Singer Company, New York, N.Y.
Filed March 29, 1971, Ser. No. 128,755
Int. Cl. A47l *5/34*
U.S. Cl. 15—354 **7 Claims**



An upright vacuum cleaner having a suction nozzle at the front of an access plate mounted on the bottom of the chassis. At least four nozzle height positions relative to the surface of the floor to be cleaned is obtained by manually indexing an adjusting lever pivotably mounted on one side of the cleaner and having a pin mounted in one leg thereof. The rear wheels of the cleaner are rotatably mounted on the ends of a crank type offset axle pivotably mounted on the bottom of the cleaner frame. Two front wheels of the cleaner are each mounted on one leg of separate U-shaped axles, each having its other leg pivotally supported on opposite sides of the bottom of the frame. Linage assemblies connect each end of the rear axle to the respect wheel mounted leg of each front wheel axle. The linkage on the adjustable lever side of the cleaner includes a slot for receipt of the lever pin so that as the lever is pivotably moved the pin drives the linkage, thus causing the front and rear axles simultaneously to pivot on their respect journals. This effects a change in the relation between all four wheels and the cleaner housing, thereby raising or lowering the nozzle relative to the floor.

3,713,186
WHEEL STAKE
Robert S. Cartwright, Booneville, N.C., assignor to Stewart-Warner Corp., Chicago, Ill.
Filed March 12, 1971, Ser. No. 123,565
Int. Cl. A47b *9/100*
U.S. Cl. 16—45 **2 Claims**

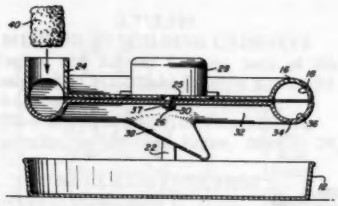


The following specification describes a two-wheeled caster in which the shaft rotatably supporting the caster wheels at opposite ends has a head at each end of smaller diameter than the shaft with a peripheral groove between each head and the adjacent main portion of the shaft to define a shoulder. The shaft engages in a correspondingly sized recess in each caster wheel with each recess terminating in a small diameter recess for receiving the respective shaft head. A thin wall section located between each small diameter caster recess and the adjacent shaft receiving recess is deformed into the groove to rotatably secure the shaft to each caster wheel.

3,713,187
APPARATUS AND METHOD FOR FORMING MEATBALLS

Joseph R. Quartarone, and Irene E. Quartarone, both of 204 Sutton Hill Rd., North Andover, Mass.

Filed Jan. 25, 1971, Ser. No. 109,511
Int. Cl. A22c 07/00
U.S. Cl. 17—32 13 Claims

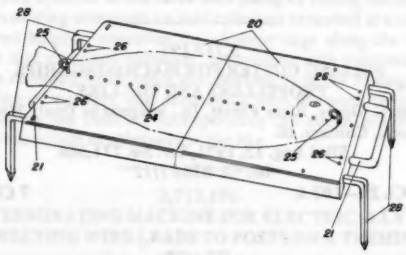


A pair of relatively rotatable members defining concentric circular grooves generally semi-circular in cross-sectional shape closely opposing each other. One of the members is provided with an inlet neck opening into the corresponding groove and through which a quantity of ground meat may be introduced into the opposing groove. The other of the members includes a discharge chute opening outwardly from the associated groove through which rolled balls of meat may be discharged from within the grooves. The members are relatively rotatable about an upstanding axis and the grooves are disposed in generally concentric, opposed relation with the member defining the upper groove provided with the inlet neck and the member defining the lower groove provided with the discharge chute whereby a quantity of ground meat to be rolled into a ball may be gravity fed into the grooves through the inlet neck and gravity discharged from the grooves through the outlet chute, the former opening upwardly and the latter opening downwardly.

3,713,188
FISH FILLETING AND SKINNING BOARDS

Forrest E. Holladay, 14314 Shadywood Dr., Plymouth, Mich.

Filed Aug. 10, 1970, Ser. No. 62,512
Int. Cl. A22c 25/06
U.S. Cl. 17—70 8 Claims

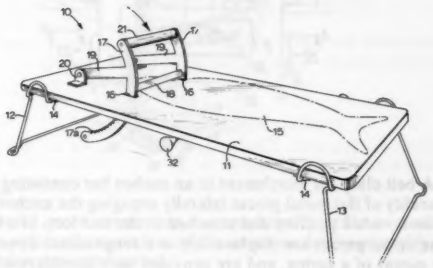


A portable fish dressing table, folding for compactness and providing an internal compartment for storage of required dressing equipment such as a knife, whetstone, skewers or other implements. When opened, the sections flatly abutt to form a dressing table on which fish of variable lengths may be attached at both ends to facilitate filleting and dressing operations; also a table on which to work in skinning, scaling, cutting up or other dressing operations. When so opened flatly, a variety of means are provided to secure the board, itself, to different work surfaces where it will be used, such as suction cups to attach to kitchen drain boards or tables and storable spikes to affix in the ground at camp sites or to lock over laundry tubs of variable widths.

3,713,189
FISH CLAMPING TABLE

John Tkachuk, c/o Invention Development Foundation, 155 Kent Street, Sudbury, Ontario, Canada

Filed Feb. 16, 1972, Ser. No. 226,657
Int. Cl. A22c 25/00
U.S. Cl. 17—70 7 Claims

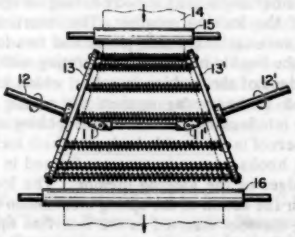


A table for cleaning fish having a clamp member at one end of the table to engage the head or tail of the fish, the clamp member comprising a pair of spaced apart, arcuate arms passing through openings in the table, the arms having a transversal fish engaging member therebetween. One side of each arm is provided with teeth enmeshing with toothed guide wheels mounted subjacent the table, the guide wheels being lockable in various positions, depending on the size of the fish being cleaned.

3,713,190
METHOD FOR DEVELOPING AND CONVERGING A BAND OF FIBERS OR THREADS

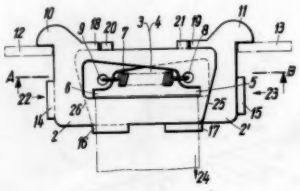
Masahide Yazawa; Haruhisa Tani; Masaki Matsumoto, and Yasuo Sasaki, all of Tokyo, Japan, assignors to Polymer Processing Research Institute, Ltd., Tokyo, Japan

Claims priority, application Japan, July 3, 1969, 44/52635
Filed June 19, 1970, Ser. No. 47,775
Int. Cl. D01d 11/02
U.S. Cl. 19—65 T 4 Claims



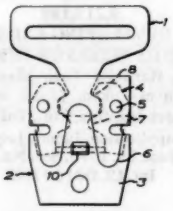
The present invention provides a method and apparatus for uniformly spreading and converging, that is, altering the width of a band of fibers or threads arranged in parallel, while the band travels in a lengthwise direction, into a predetermined width and thickness with the least amount of uneveness. The fibers are spread and converged by placing the band of fibers on a rotating conveyor in which the forward path of travel widens and the return path narrows. The resulting fibers are well adapted for subsequent textile processing.

3,713,191
BELT CLASP
Ludwig Hofmann, Markgrafenstr. 10, Buhl/Baden, Germany
Filed Feb. 23, 1971, Ser. No. 118,008
Claims priority, application Germany, April 7, 1970, P 20 16 451.6
Int. Cl. A44b 17/00; A44c 5/18
U.S. Cl. 24—201 A 2 Claims



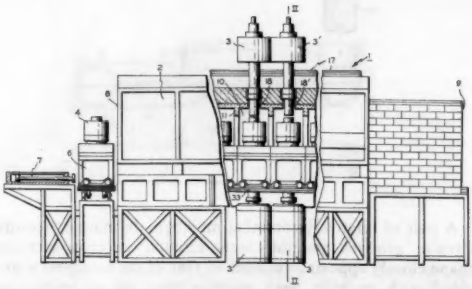
A belt clasp for attachment to an anchor bar consisting of a plurality of flat metal pieces laterally engaging the anchor bar in an inverted position and attached to the end loop of a belt. The metal pieces are displaceable in a longitudinal direction by means of a spring, and are provided with shoulders which engage support surfaces on the anchoring bar to secure the belt therein.

3,713,192
BUCKLES FOR SAFETY BELTS
Jan-Olof Raymond Wallin, Monsteras, Sweden, assignor to Stece-AB Industrifjadrar
Filed Feb. 29, 1972, Ser. No. 230,285
Claims priority, application Sweden, March 5, 1971, 2822/71
Int. Cl. A44b 11/26
U.S. Cl. 24—230 AT 4 Claims



A buckle for safety belts for vehicles comprises a belt locking member and a buckle body having an opening for the insertion of the locking member. The insertion opening is defined by two stationary side plates and two locking hooks pivoted to the buckle body and cooperating with the two longitudinal edges of the locking member, which locking hooks are adapted to be swung against the action of a spring mechanism into locking position by the locking member upon insertion thereof in the buckle body, in which locking position the locking hooks engage in recesses formed in the two longitudinal edges of the locking member. The locking hooks, which under the action of the spring mechanism tend to expel the locking member inserted in the insertion opening of the buckle body, cooperate with a spring-loaded latch which in the locking position engages the locking hooks and which is adapted, upon release of the buckle, to be moved out of the engagement with the locking hooks by an operating member against spring action. This latch is movable substantially at right angles to the two side plates of the buckle, extends between the side plates, and cooperates with recesses which are formed in the side plates and serve as guides for the latch. The operating member is an arm which is pivoted to one side plate of the buckle body, is formed as a push button, and cooperates laterally of the axis of pivotment with the latch to move it when the arm is swung.

3,713,193
REFRACTORY POWDER HOT-PRESSING SYSTEM
Hiroyuki Chiba, Neyagawa; Hideaki Masuda, Moriguchi, and Eiichi Hirota, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 12, 1970, Ser. No. 79,871
Claims priority, application Japan, Oct. 21, 1969, 44/84524
Int. Cl. F27b 9/02
U.S. Cl. 25—132 8 Claims

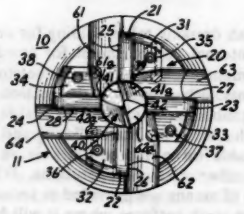


A system for hot-pressing refractory powders into dense sintered bodies comprises a tunnel type furnace having a given temperature distribution therein, a plurality of die assemblies each of which has a refractory powder sandwiched between an upper punch and a lower punch thereof, a plurality of supporters for said plurality of dies. At least one pressing means is positioned at a given position in the tunnel type furnace to be at a given temperature. Means are provided for conveying said supporters intermittently one by one from an inlet of said tunnel type furnace through said at least one pressing means to an outlet of said tunnel type furnace, whereby the refractory powder in each of said die assemblies is hot-pressed into a dense sintered body by said at least one pressing means and the dense sintered bodies are conveyed to said outlet. The equipment is suitable for mass-production of hot-pressed bodies of materials such as ferrites and ferroelectric oxides.

ERRATUM

For Class 26—18 see:
Patent No. 3,713,219

3,713,194
MILLING CUTTER FOR MACHINING SHIPS PROPELLERS AND THE LIKE
James C. Danly, River Forest, Ill., assignor to Danly Machine Corp., Chicago, Ill.
Filed Aug. 13, 1971, Ser. No. 171,566
Int. Cl. B26d 1/12
U.S. Cl. 29—103 A 7 Claims



A face mill for contour milling of ships' propellers and the like for use where the cutter axis is rocked as it is advanced

along a convex surface to maintain perpendicularity with the surface, in which the cutter body has a bore surrounded by evenly spaced sockets receiving cutter inserts, an auxiliary face type milling cutter being telescoped into the bore and providing cutting edges which extend from the inner edges of the inserts substantially all the way to the axis. All of the cutting edges are precisely positioned in a common plane which is perpendicular to the axis of the tool body.

3,713,195

METHOD OF BUILDING CHIMNEYS

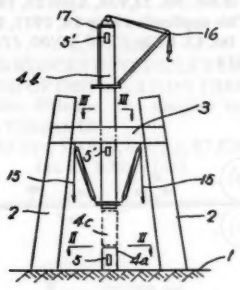
Akiyoshi Togiya, and Satoshi Kakuda, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Chiyoda-ku, Japan

Filed March 17, 1971, Ser. No. 125,312

Claims priority, application Japan, March 20, 1970, 45/23908

Int. Cl. B23p *17/00, 19/00*

U.S. Cl. 29—155 C **1 Claim**



Method of building chimneys or the like characterized by the steps of using one of the upstanding cylinders of the chimney or the like as an elevator shaft, fixing a rack rail vertically on the inner wall of the lowermost unit cylinder fixed on the foundation the cylinder, providing an elevator cage movable up and down along the rack rail engaging with the rack rail and being supplied by electric power, providing an entrance for the elevator cage on the cylinder wall, providing rack rails continuous with said rack rail in the cylinders extended above said fixed cylinder at the same time piling or raising the chimney, providing entrances on said cylinders extended at each of required heights, operating the elevator cage along the rack rail in said extended cylinders, proceeding with construction of the chimney while using the elevator cage for raising and lowering of workers, and proceeding with the work by piling and raising the chimney incorporating the above process in the construction of chimneys or the like.

3,713,196

TERMINATING MACHINE FOR ELECTRICALLY CONNECTING WIRE LEADS TO POSTS ON A TERMINAL BOARD

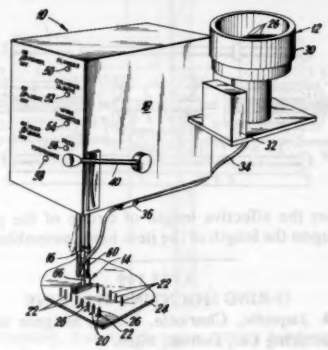
Peter Garner, Bernardsville, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Sept. 15, 1971, Ser. No. 180,677

Int. Cl. H1r *43/04*; H05k *13/04*

U.S. Cl. 29—203 B **11 Claims**

A terminating machine comprises a combination of mechanism for effecting the connection of a stripped wire (either stranded or solid) to a terminal post of an integrated circuit panel board. The several mechanisms include sorting and feeding means for the electrical connectors, wire bearing and inserting means for inserting the wires into the connector preparatory to crimping about the terminal post, and extruding means for forming a gas-tight connection between the stripped wire and the terminal post to complete the electrical connection. The apparatus of the subject invention may be



mounted on a convention *x–y* machine in order to enable semi-automatic operation of the machine during assembly of an interconnection panel.

3,713,197

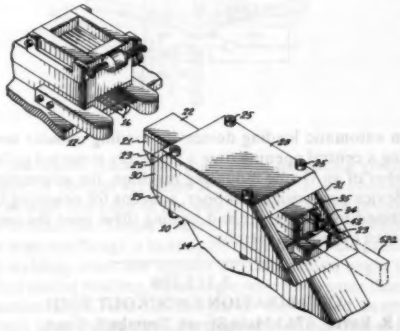
PIN INSERTION HEAD

Robert O. Crump, Scottsdale, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed March 4, 1971, Ser. No. 140,169

Int. Cl. H05k *13/04*

U.S. Cl. 29—203 B **7 Claims**



A pin insertion head receives a plurality of pins from a pin aligning device and inserts the pins into a circuit board. The pin insertion head includes a plurality of slots with each slot having a ball bearing friction device holding the pin into the slot. Each of the slots has a rod mounted therein to contact the stored pin. A pusher block actuates the plurality of rods for insertion of the stored pins into the circuit board.

3,713,198

DOUBLE-ACTION HYDRAULIC FORCING PRESS

Lev Zeilikovich Tobak; Semen Abramovich Shterman; Mikhail Gallieevich Brandenburgsky; Nikolai Iosifovich Lichman, and Andrei Lukyanovich Lugovskoi, all of Odessa, U.S.S.R., assignors to Odessky Zavod Pressov, Odessa, U.S.S.R.

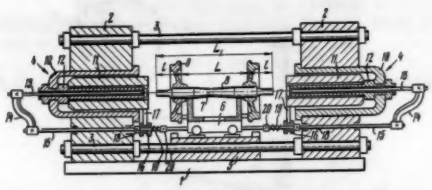
Filed Aug. 2, 1971, Ser. No. 168,126

Int. Cl. B23p *19/04*

U.S. Cl. 29—208 C **6 Claims**

Fixed inside each of the hydraulic cylinders is a thrust sleeve having an axial bore which accommodates a feeler rod axially movable in said bore. The feeler rod is mechanically interlinked with the plunger of a respective hydraulic cylinder and is adapted to intract with the axle of the item being assembled that is positioned in between the hydraulic cylinders and onto

which its members are to be forced, and with the corrector device which, while interacting with one of said members,

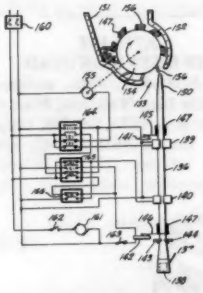


determines the effective length of stroke of the plunger depending upon the length of the item being assembled.

3,713,199
O-RING MOUNTING MACHINE

Robert D. Jaquette, Charlotte, Mich., assignor to Air-Way Manufacturing Co., Detroit, Mich.

Division of Ser. No. 37,955, May 18, 1970, Pat. No. 3,665,578. This application March 15, 1972, Ser. No. 234,956
Int. Cl. B23q 7/10; B23p 19/02
U.S. Cl. 29—211 R **1 Claim**

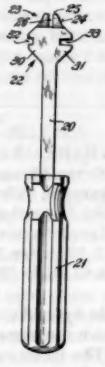


An automatic loading device for loading annular members having a central opening over a vertically mounted cylindrical member of an O-ring mounting machine, the automatic loading device comprising a hopper, a means for orienting O-rings contained in the hopper and loading them over the vertically mounted cylindrical member.

3,713,200
COMBINATION KNOCKOUT TOOL

Fred R. Burns, 6763 Main Street, Trumbull, Conn.

Filed June 23, 1971, Ser. No. 155,890
Int. Cl. B23p 19/04
U.S. Cl. 29—267 **3 Claims**

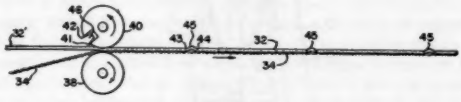


A combined tool for removing knockouts and mounting rings therefor from electrical fittings or outlet boxes to provide suitable apertures therein to receive the wires and to enable suitable conduits for the electrical wiring to be connected thereto. The tool has a knockout engaging tip having a slot therein for engaging a deflected and partially released knockout to assist in removing the same to provide a conduit receiving aperture. If the aperture produced by the knockout is too small, it can be enlarged by removing the knockout mounting ring secured to the wall by frangible connections. To do this the tool is provided with wings adjacent said tip which are provided with side opening slots adapted to be positioned over the ring, after the knockout has been removed, and the tool manipulated with a rocking motion to remove the ring. The tool thus provides a means for easily and quickly producing conduit receiving apertures.

3,713,201
METHOD AND APPARATUS FOR MANUFACTURING MERCURY-VAPOR CONTROL ASSEMBLIES FOR ELECTRIC DISCHARGE DEVICES

George S. Evans, Caldwell, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 32,924, April 29, 1970, Pat. No. 3,614,506. This application May 14, 1971, Ser. No. 143,426
Int. Cl. B23p 17/00, 19/00, 11/00
U.S. Cl. 29—414 **10 Claims**



The mercury-vapor pressure within a fluorescent lamp is controlled by an amalgam-forming metal that combines with mercury and is enclosed in a foraminous container disposed at a selected location within the lamp envelope. The vapor-pressure control assembly is fabricated from two strips of wire mesh that are pressed into overlying sandwiched relationship with a strip of amalgam-forming metal by passing the strips between a pair of rollers. Leakage of the amalgam-forming metal (and amalgam) when in a fluid state is prevented by providing a border of overlapped wire mesh that is devoid of metal and extends around the periphery of the assembly. Mass production on a continuous basis is achieved by using two sets of paired rollers, one set of which includes cutting means that severs the strip of amalgam metal and permits segments of the metal to be removed before the second wire mesh strip is pressed into place. The composite mesh-amalgam strip is then severed along the resulting gaps between the enclosed lengths of amalgam metal.

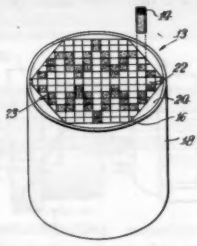
3,713,202
METHOD OF FORMING COLLIMATED HOLE STRUCTURE

John A. Roberts, North Chelmsford; Peter R. Roberts, Groton; Alwyn H. King, Sherborn, and Lee B. Danzey, Arlington, all of Mass., assignors to Brunswick Corporation

Division of Ser. No. 701,774, Jan. 30, 1968, abandoned. This application Sept. 20, 1971, Ser. No. 182,102
Int. Cl. B23p 17/00
U.S. Cl. 29—423 **9 Claims**

A method of making a collimated hole structure wherein the passages have preselected non-regular cross sections defined by a composite of preselected regular sections. Examples of such non-regular cross sections are T, L, S, I, star, trilobal, and various non-symmetrical sections. The collimated hole structures are formed by constricting a plurality of rods having the regular section configuration laterally related to define the non-regular cross sectional configuration. The rods

corresponding to the passage configurations are formed of a material differing from that of the other rods to permit



removal thereof upon completion of the constriction operation whereby small size passages are formed having the desired non-regular cross section.

3,713,203

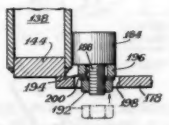
MOUNTING BLOCKS IN VEHICLE FRAME AND METHOD OF INSTALLATION THEREIN

Ronald J. Fanslow, Palatine, Ill., assignor to International Harvester, Co., Chicago, Ill.

Filed Nov. 5, 1970, Ser. No. 87,038

Int. Cl. B23p *11/00*

U.S. Cl. 29—428 **3 Claims**



Mounting blocks, embodying preformed means to which hold down fasteners are to be secured, are located inside a vehicle frame by means of a positioning fixture, so as to conform to the preformed pattern of bolt openings in a door to fit across the frame. In one preferred example, the blocks are metal cylinders embodying eccentric tapped bolt openings. After the positions of the openings are fixed on locator pins on the positioning fixture, the individual mounting blocks are eccentrically swung thereabout outwardly to a snug position against the inside frame walls, and then are permanently welded thereto to receive the door.

3,713,204

METHOD FOR CONNECTING TUBULAR MEMBERS

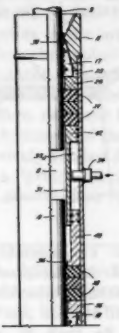
Arnold James F., Shreveport, La., assignor to Hydrocouple Corp., New Orleans, La.

Continuation of Ser. No. 709,678, March 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 486,154, Sept. 9, 1965, Pat. No. 3,393,926. This application April 30, 1970, Ser. No. 33,494

Int. Cl. B23p *3/00, 19/04*

U.S. Cl. 29—460 **2 Claims**

A method is provided for joining together two lengths of pipe in an environment wherein conventional methods are not suitable, e.g., underwater. The method includes introduction of fluid under pressure from a remote source into a coupling member surrounding a pipe length to be joined, the fluid under pressure acting to effect the coupling to grip the pipe length and then become sealingly engaged therewith. In one embodiment, a method is provided wherein a hardenable material is used which is in the fluid state when introduced



into the coupling, but which upon setting hardens into the solid state to form a relatively permanent connection.

3,713,205

PROCESS FOR THE PRODUCTION OF SECTIONS

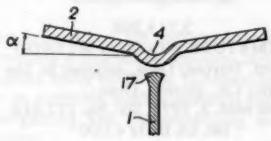
Alfred Wogerbauer, Linz, Austria, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Dec. 3, 1970, Ser. No. 94,681

Claims priority, application Austria, Dec. 5, 1969, 11353

Int. Cl. B23k *31/02*

U.S. Cl. 29—480 **2 Claims**



The disclosure relates to a process for producing girders in the shape of flanged sections, in particular T- or I-beams, in which at least one edge of the web is welded to the broad surface of at least one flange, wherein the improvement resides in that at least one flange is bent up on both sides of the predetermined welding seam line against the contraction angle to be expected during welding, by an angle which is greater than this contraction angle, and the flanges of the formed beam are bent back after welding into the desired position. This process has the advantage that one is independent from deformations in the welding machine, and that contraction stresses are eliminated.

3,713,206

METHOD FOR THE MANUFACTURE OF A COMPOSITE REFRACTORY METALLIC ELEMENT WITH POROUS COATING

Philippe M. Galmiche, Clamart; Jean H. Pelissier, Verrieres-le-Buisson, and Roland R. Spinat, Bretigny-sur-Orge, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon-sous-Bagneux and Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed June 8, 1970, Ser. No. 44,508

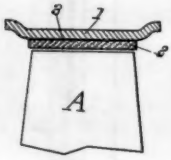
Claims priority, application France, June 10, 1969, 6919210

Int. Cl. B23k *31/02, 35/38*

U.S. Cl. 29—494 **7 Claims**

The casing of a turboreactor is constituted of a refractory alloy based on nickel and includes an abradable porous metallic coating constituted by a nickel felt. The coating is bonded by brazing to the casing by applying the coating on the casing

by a pressure ring with a larger coefficient of expansion and by effecting the brazing in a fluorinated-hydrogenated atmosphere at a temperature in the region of the fusion temperature of the solder. The assembly is then subjected to a chromization or chromaluminization treatment in a halogenated-hydrogenated atmosphere (free of fluorine) at a temperature of 800° to 1100°C.



3,713,207

METHOD FOR DIFFUSION BONDING UTILIZING SUPERPLASTIC INTERLAYER

Duane L. Ruckle, Enfield, Conn., and Robert A. Sprague, Kensington, Conn., assignors to United Aircraft Corp., East Hartford, Conn.

Filed Dec. 28, 1970, Ser. No. 102,133
Int. Cl. B23k *31/02, 35/24*
U.S. Cl. 29—498 **4 Claims**

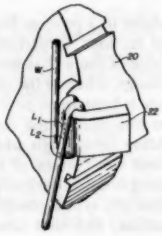
Articles are formed by diffusion bonding techniques wherein a foil of superplastic material is sandwiched between the surfaces to be joined.

3,713,208

ARMATURE WINDING METHOD

John M. Biddison, Dayton, Ohio, assignor to The Globe Tool and Engineering Co., Dayton, Ohio

Filed Sept. 3, 1971, Ser. No. 177,618
Int. Cl. H01r *43/00*
U.S. Cl. 29—597 **8 Claims**



A double loop of wire is formed about a commutator hook before an armature coil is wound, the double loop gripping the hook with sufficient strength to withstand the force generated when the first coil is being wound tending to pull the wire away from the hook. While forming the double loop, the free end of the wire is clamped, the clamped wire portion being severed after the double loop is formed. During the forming of at least the second loop, the wire is positively guided into hooking relation to the commutator hook.

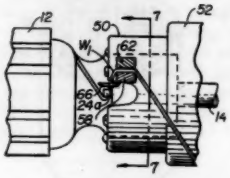
3,713,209

AUTOMATIC ARMATURE WINDING

John M. Biddison, Dayton, Ohio, assignor to the Globe Tool and Engineering Co., Dayton, Ohio

Continuation-in-part of Ser. No. 67,759, Aug. 28, 1970, abandoned. This application Dec. 14, 1970, Ser. No. 97,488
Int. Cl. H01r *43/00*
U.S. Cl. 29—597 **26 Claims**

The connecting wires between armatures wound by an automatic armature winding machine are clamped closely adjacent the commutator tangs with the finish wires hooked to the tangs of the wound armatures and the start wires looped about selected tangs of the armatures about to be wound. The clamped wire portions are severed at the end of the winding of a wound armature and then after the looping of the start wires about the tangs of the armature to be wound. The wire wasted is limited to the short, clamped wire portions. Also disclosed are two embodiments of double flier armature winding machines for winding armatures in accordance with the invention.

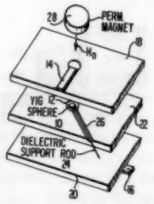


3,713,210

TEMPERATURE STABILIZED COMPOSITE YIG FILTER PROCESS

James M. Schellenberg, Glen Burnie, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 15, 1970, Ser. No. 80,986
Int. Cl. H01p *11/00*
U.S. Cl. 29—593 **11 Claims**



A method whereby the variation with temperature of the biasing magnetic field of a device such as a YIG filter is cancelled by the temperature sensitive anisotropy drift of the YIG resonator element. From the knowledge of the anisotropy variation with temperature and the change in the resonant frequency of the filter over a predetermined temperature interval, a correctional frequency to which the YIG sphere must be rotated is obtained. A subsequent rotation to this frequency will provide a change in the anisotropy field such that the variation with temperature of the biasing field will be matched by a corresponding opposite change in the anisotropy field.

3,713,211

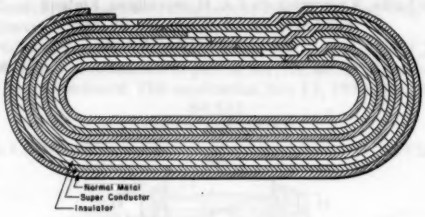
METHOD OF FABRICATING A SUPERCONDUCTING MAGNET

Donald C. Freeman, Jr., Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 798,510, Oct. 22, 1968, which is a division of Ser. No. 729,836, Feb. 21, 1968, Pat. No. 3,440,585, which is a continuation-in-part of Ser. No. 613,682, Feb. 2, 1967, which is a continuation of Ser. No. 455,807, May 14, 1965, abandoned. This application May 3, 1971, Ser. No. 139,886
Int. Cl. H01v *11/00*
U.S. Cl. 29—599 **9 Claims**

This invention relates to a superconducting magnet formed of layers of serially connected helices of superconducting material on non-superconducting substrates. Each supercon-

ducting layer is deposited upon a non-superconducting layer in a manner such that alternate ends form superconducting



joints. The superconducting materials are microscopic platelets of metallic particles bonded to each other and to the non-superconducting substrate.

3,713,212

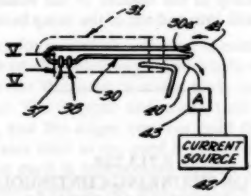
METHOD OF MAKING A TRANSDUCER HEAD

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Division of Ser. No. 746,651, July 22, 1968, Pat. No. 3,582,572. This application Nov. 18, 1970, Ser. No. 90,773

Int. Cl. G11b *5/42*; H01f *7/06*

U.S. Cl. 29—603 **4 Claims**



A method of making a magnetic transducer head or element thereof from a binary alloy of silicon and iron, preferably containing from about 3 percent to 7 percent of silicon by weight, including provision of a grain-oriented silicon-iron core, annealing the core at a temperature above the Curie point in a dry hydrogen atmosphere and during cooling from that temperature subjecting the core piece to a magnetic field applied in the direction of the working flux at the core. The annealed core piece is formed so as to provide a gap-defining face for coupling to a magnetic record medium, the gap being of the order of about 1 micron.

3,713,213

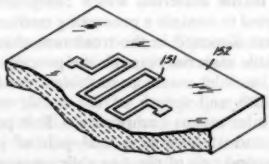
EXPLOSIVE BONDING OF WORKPIECES

Benjamin Howell Cranston, Trenton, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 68,431, Aug. 31, 1970, which is a continuation-in-part of Ser. No. 6,829, Jan. 29, 1970, abandoned. This application Nov. 26, 1971, Ser. No. 202,527

Int. Cl. H01c *7/00*, *17/00*

U.S. Cl. 29—620 **9 Claims**



First workpieces, for example, beam-leaded integrated circuits, and the like, are bonded to second workpieces, for example, metallized ceramic substrates by first depositing a quantity of primary explosive, such as lead azide, onto each beam lead and then detonating the explosive to explosively bond the integrated circuits to the substrate. In another embodiment of the invention, the explosive bonding force is applied through a buffer sheet of plastic or metallic material which protects the surface of the substrate from contamination and which, in addition, dampens the shock of the explosion. In yet another embodiment of the invention, metal conductive paths are explosively bonded directly to a ceramic or glass substrate to form a "printed circuit pattern." The same techniques are used to manufacture resistors, capacitors, inductors, etc.

3,713,214

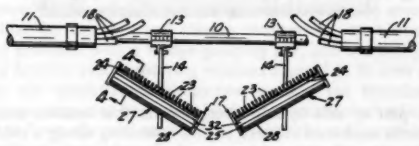
WIRE SPLICE ASSEMBLY STATION

Dennis J. Enright, St. Paul; Richard D. Kahabka, Burnsville, and Donald F. Miller, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 823,598, May 12, 1969, abandoned. This application Nov. 23, 1970, Ser. No. 91,779

Int. Cl. H01r *43/00*

U.S. Cl. 29—628 **7 Claims**



Apparatus and method are described for splicing together the corresponding wire-ends of opposing sections of communications cables using solderless U-connector multiple-layer modules in an assembly station including module supporting means, wire-guiding and wire-separating means, and wire-retaining means.

3,713,215

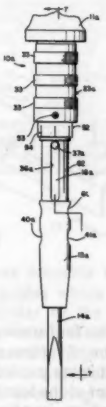
WIRE STRIPPER AND CUTTER

Leonard Van Dalen, Cherry Hill, and George S. Gadren, Oaklyn, both of N.J., assignors to Seaboard Fabricators, Inc., Cherry Hill, N.J.

Continuation-in-part of Ser. No. 57,095, July 22, 1970, Pat. No. 3,636,798. This application June 1, 1971, Ser. No. 148,411

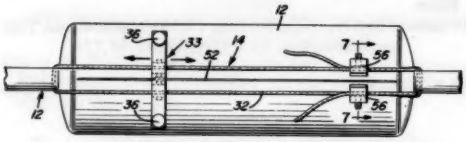
Int. Cl. H02g *1/12*

U.S. Cl. 30—90.1 **5 Claims**

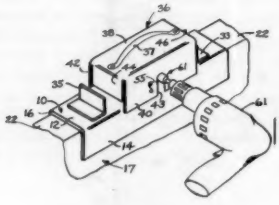


A shank having a handle fixed on one end and a tubular part slidably telescoped on the other end, with coacting cutting

edges on the shank and tube for stripping and cutting wire. Carried on the shank between the handle and tube is an adjustable stop member for limiting engagement with a formation of the tube for operation on different sizes of wire.

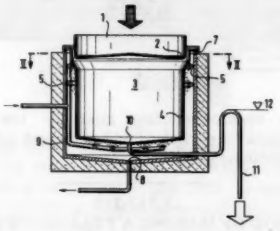
3,713,216
LEAD SLEEVE CUTTER
Bobby R. Long, Monroe, La., assignor to Joe D. Guerriero, Monroe, La., a part interest
Filed June 14, 1971, Ser. No. 152,684
Int. Cl. B26d 3/16; B26b 27/00
U.S. Cl. 30—90.4 10 Claims

A pair of side-by-side elongated flexible tension member sections anchored relative to and extending along a member to be slit with the tension member sections tensioned and paralleling each other, a follower being provided and guidingly engaged with the tension members for movement there along and including a cutting wheel for cutting the member to be slit as the follower is moved there along.

3,713,217
DOOR LATCH CUT-OUT FORMING
Claud Frederick, Jr., Cincinnati, and Harold L. Woodrum, Westchester, both of Ohio, assignors to American Standard Inc., New York, N.Y.
Filed April 26, 1971, Ser. No. 137,249
Int. Cl. B26d 3/08
U.S. Cl. 30—287 5 Claims



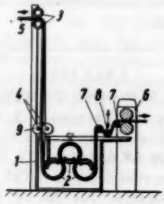
A method and apparatus for forming a cut-out in the edge of a metal door for reception of various size mortise lock latches. The method and apparatus are particularly conceived for employment at the job site or at the local door distribution point, such that the door distributor is able to stock relatively few standard doors (without latch cut-outs) instead of a larger number of similar doors having special size latch cut-outs.

3,713,218
DEVICE FOR THE COOLING AND PRELIMINARY TREATMENT OF MILK FRESH FROM THE COW
Eero Laike, Kasarminkatu 1 A, Hameenlinna, Finland
Filed May 14, 1970, Ser. No. 37,222
Int. Cl. A01j 11/00
U.S. Cl. 31—4 7 Claims



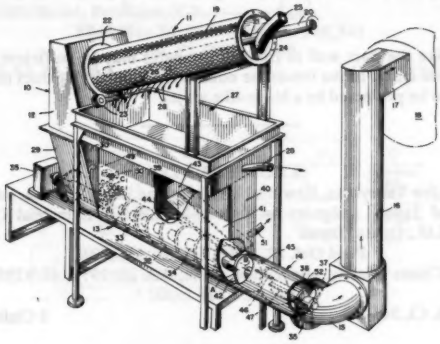
Milk fresh from the cow is brought into contact with the cold walls of a vessel so that it flows therealong in the form of a thin membrane whereby it is cooled, and the cooled milk is collected in a sump at the bottom of the vessel, the feeding velocity of the milk into and out of the sump being adjustable.

3,713,219
APPARATUS FOR SHRINKING CONTINUOUS LENGTHS OF TEXTILE MATERIALS
Heinz Fleissner, Egelsbach, Germany, assignor to VEPA AG, Basel, Switzerland
Filed Nov. 26, 1969, Ser. No. 880,350
Claims priority, application Germany, Nov. 28, 1968, P 18 11 380.9; Aug. 4, 1969, P 19 39 993.0
Int. Cl. D06c 29/00
U.S. Cl. 26—18.5 23 Claims



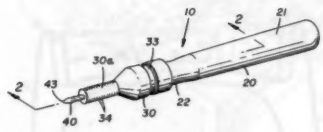
The present disclosure is directed to an apparatus for the shrinkage of textile materials which comprises a treatment chamber adapted to contain a processing medium, at least one guiding element disposed in the treatment chamber for conveying the textile material through the processing medium in said chamber, an inlet means permitting a variable overfeeding in the width and length of the textile material being treated, said inlet means comprising a first pair of draw-in roller means and at least a second pair of pleating roller means, said second pair of pleating roller means, as viewed in the direction of material passage, being provided with forming elements which are in overlapping arrangement with each other; and outlet means for removing the textile material.

3,713,220
APPARATUS FOR MIXING CHEESE CURD
Lester O. Kielsmeier, Wheatridge, and James G. Leprino, Gosden, both of Colo., assignors to Leprino Cheese Mfg. Co., Denver, Colo.
Division of Ser. No. 775,980, Oct. 7, 1968, Pat. No. 3,531,297, which is a continuation-in-part of Ser. No. 643,372, June 5, 1967, abandoned. This application July 13, 1970, Ser. No. 54,515
Int. Cl. A01j 25/11
U.S. Cl. 99—459 13 Claims



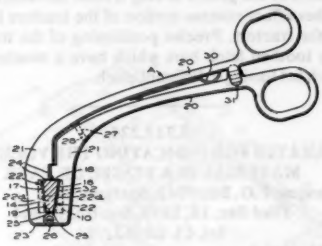
An apparatus for mixing cheese curd in contact with heated water includes an elongated auger unit which extends through a feed hopper for the curd, a water tank, and a cylindrical jacket or tube. The hopper and water tank are filled with heated water, and the auger conveys curd from the hopper through the water tank as the curd is mixed and stretched by the auger. The curd is compressed against the auger by an inclined deflector plate in the tank, the curd is further compressed as it passes into the cylindrical tube. Additional compression and mixing is caused by a restricting plate at the end of the tube which restricts the outflow of the curd thereby creating back pressure in the tube. The curd is prevented from turning with the auger by a longitudinally extending baffle on the deflector plate and longitudinally extending baffles which extend radially inwardly from the tube. Control means are provided for maintaining the water at the desired temperature while the curd is being mixed.

3,713,221
ROOT CANAL INSTRUMENT
Oscar Malmin, 127 E. Wayne St., Akron, Ohio
Filed June 9, 1971, Ser. No. 151,475
Int. Cl. A61c 3/08
U.S. Cl. 32—57 11 Claims



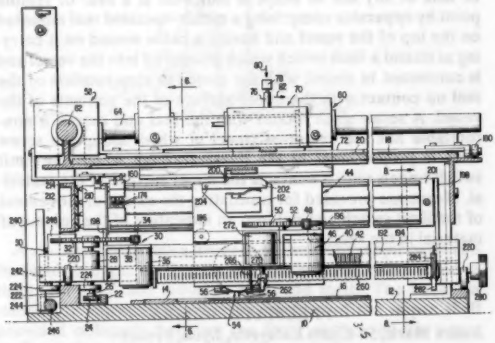
A dental instrument for root canal preparation including a hollow plastic sleeve having opposed open ends and an enlarged central area which can receive the head of a conventional reamer while its cutting end projects from one of the open ends thereof. The sleeve also has a series of gradations in the form of circumferential grooves on its outer surface to enable it to be accurately cut off to any desired length. The sleeve is also adapted to be used with a variety of handles including an axially extending handle for anterior use and a right angle handle for posterior use.

3,713,222
DENTAL INSTRUMENT FOR USE WITH INTERDENTAL WEDGES
Benjamin F. Tofflemire, 41301 Crest Drive, Hemet, Calif.
Filed June 8, 1972, Ser. No. 261,089
Int. Cl. A61c 3/00
U.S. Cl. 32—64 5 Claims



Dental instrument for use with an interdental wedge, wherein the latter has a base with an interdental wedge portion extending from the base in one direction and a quadrilateral projection extending in the opposite direction, the instrument having a pair of operating handles swingably secured together for opening and closing movements, each handle being provided with a wedge-grasping jaw, and the two jaws being formed with registering recesses located to fit over and grasp the quadrilateral projection so that the interdental wedge portion may be pushed between adjacent teeth of a patient to force a looped matrix band against the axial contour of a previously banded tooth.

3,713,223
AUTOMATIC SCRIBING MACHINE
Robert A. Hunt, Silver Creek, N.Y., assignor to F. M. Biggar, Jr., Hamburg, N.Y.
Filed Dec. 29, 1971, Ser. No. 213,514
Int. Cl. B43l 13/10
U.S. Cl. 33—24 C 7 Claims



A pair of carriages are movable in mutually orthogonal directions and include guides which cross or intersect and which extend perpendicular to the directions of carriage movements. The guides overlie a table upon which a pattern is placed and a manually movable targeting member slidably engages the guides at their intersection and carries a window having a cross hair sight. In moving the targeting member so that the cross hairs align with a desired point on the pattern, the guides and carriages are moved. Another table is disposed below the pattern table and upon which the plate to be scribed

is positioned. Tractors are provided, one of which is movable in the direction of one carriage and carries a track projecting perpendicular to such direction. The other tractor is movable along the track and carries a retractable stylus. A joy stick control switch is provided on the targeting device to cause either one of the tractors to move in one direction only and the tractors include switches which are operated according to the locations of the guides to stop tractor movement. xhe tractor switches effect reverse motion of the tractors if the guides overrun the tractors. Precise positioning of the tractors is effected by toothed latch bars which have a number of sets of teeth, each set having a different pitch.

3,713,224

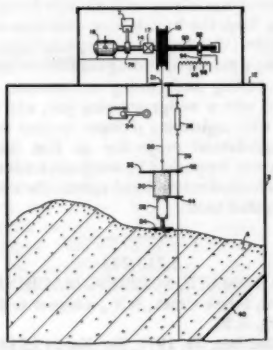
APPARATUS FOR INDICATING THE VOLUME OF MATERIAL IN A VESSEL OR TANK

Jose E. Bengoa, P.O. Box 9943, Santurce, P.R.

Filed Dec. 18, 1970, Ser. No. 99,464

Int. Cl. G01f *23/04*

U.S. Cl. 33—126.7 **2 Claims**



The volume of solid or liquid material in a containing vessel or tank of any size or shape is indicated at a near or remote point by apparatus comprising a motor-operated reel mounted on the top of the vessel and having a cable wound on it carrying at its end a limit switch which is lowered into the vessel and is connected in circuit with the motor to stop rotation of the reel on contact with the upper surface of the contents of the vessel. A screw shaft rotates with the reel and carries a non-rotatable nut the extent of travel of which along the screw shaft is proportional to the depth through which the limit switch travels until it contacts the upper surface of the material. Means are provided for translating the extent of movement of the limit switch and nut into an indication of the volume of material in the vessel.

3,713,225

PNEUMATIC DRIERS

Andre Mark, 54 Cours Lafayette, Lyon, France

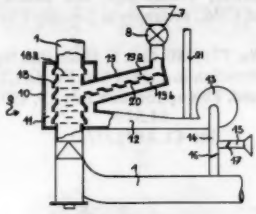
Filed April 14, 1971, Ser. No. 133,841

Claims priority, application France, April 28, 1970, 7015389

Int. Cl. F26b *17/00*

U.S. Cl. 34—10 **16 Claims**

In a pneumatic drier contact of the particles with the wall of the drying duct is eliminated by creating an air screen along the zones of the duct wall which are to be protected. In the portion of the duct wherein the material to be dried is introduced, the duct may be surrounded by a pressurized chamber from which air may flow into the duct under a high velocity through louver-like slits. Pressurized air may be forced into a frustro-conical chamber within which the drying duct is interrupted. A mere blade-like jet obliquely directed within the drying duct below the material inlet passage so as to



strike the duct wall in front of the latter may be sufficient in some cases. In the bends the outer wall of the drying duct may also be protected by a blade-like air jet.

3,713,226

CLOTHES DRYER

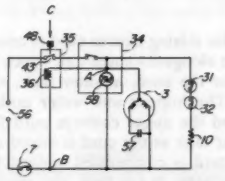
Kojiro Takeyama, Kawanishi, and Hajime Onishi, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Oct. 12, 1971, Ser. No. 188,136

Claims priority, application Japan, Oct. 20, 1970, 45/92957

Int. Cl. F26b *19/00*

U.S. Cl. 34—53 **3 Claims**



A clothes dryer so designed that a rotary drum will not start rotating even when a little child enters therein and closes an access door, unless a pushbutton type starting switch provided on the dryer is depressed externally.

3,713,227

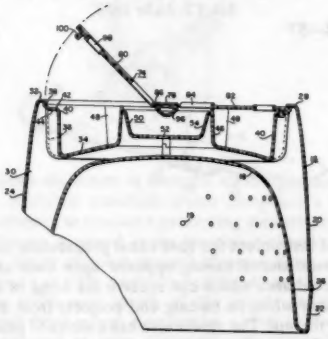
HAIR DRYER

Tim Cunningham, Pittsburgh, Pa., and Earl W. McCleerey, Mansfield, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 3, 1971, Ser. No. 112,230

Int. Cl. A45d *20/00*

U.S. Cl. 34—99 **2 Claims**



A portable hair dryer structure is disclosed having rigid outer casing of the bonnet defining molded storage compartments on its top.

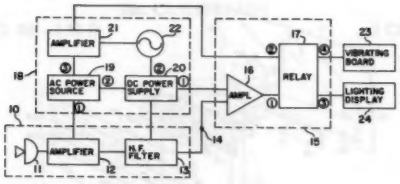
A flat cover member is provided having a central portion extending diametrically thereacross and dividing the cover into two side portions connected to the central portion by living hinges. The central portion is attached to the top of the outer casing so the side portions overlie the compartments and the side portions are so contoured to provide access for manually gripping the central portion for a carrying handle.

3,713,228

LEARNING AID FOR THE HANDICAPPED

Henry J. Mason, and Geoffrey A. Jones, both of 1432 East 65th Street, Brooklyn, N.Y.

Filed May 24, 1971, Ser. No. 146,345
Int. Cl. G09b *21/00*
U.S. Cl. 35—35 A **7 Claims**



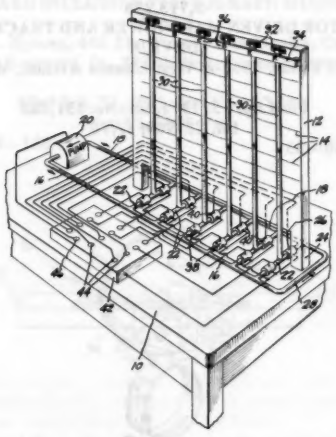
A tactile learning aid, for handicapped persons, especially children, having a severe hearing loss, in which vibrating pins contact the fingers of the handicapped person and indicate the correct pronunciation of a particular alphabetic letter.

3,713,229

DEVICE FOR USE IN TEACHING ACCOUNTING

Carl Torben Thomsen, P.O. Box 282 Andrews Station, Berrien Springs, Mich.

Filed May 10, 1971, Ser. No. 141,551
Int. Cl. G09b *19/18*
U.S. Cl. 35—24 C **5 Claims**



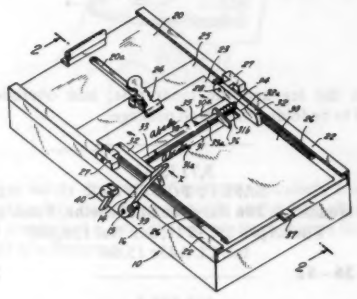
A device for use in teaching accounting wherein a plurality of upright translucent tubes are positioned alongside an upright panel having horizontal scale indicia. The tubes are connected to a liquid circulatory system having a pump, valve means associated with each upright, and valve control means for selectively controlling the valves and pump for varying the relative levels of liquid in said tubes.

3,713,230

WRITING IMPLEMENT FOR PERSONS WITH GREATLY IMPAIRED OR LOST EYESIGHT

Carl J. Essmann, 82-38 235th Street, Queens Village, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,524
Int. Cl. G09b *21/00*
U.S. Cl. 35—38 **10 Claims**



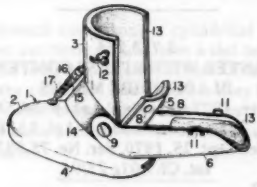
The present invention concerns writing implements or devices, especially for use by persons who have lost partial vision or completely lost eyesight.

3,713,231

SKI BOOT

Yoshinari Mochizuki, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo, Japan

Filed June 8, 1971, Ser. No. 151,106
Claims priority, application Japan, June 11, 1970, 45/49858; Dec. 23, 1970, 45/131142
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AL **7 Claims**



A ski boot comprises a lower shell enclosing major parts of a foot and an upper shell in the form of an ankle cuff pivoted to the lower shell and movable back and forth. The boot has means for adjusting forward inclinations of the upper shell provided obliquely between the front surface of the upper shell and the upper surface of the lower shell.

3,713,232

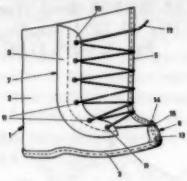
OVERBOOT

Otto Alwin Ludwig Bohmann, Oosterbeek, Netherlands, assignor to N. V. Rubberfabriek Vredestein, The Hague, Netherlands

Filed April 12, 1971, Ser. No. 133,160
Claims priority, application Netherlands, April 21, 1970, 7005735
Int. Cl. A43b *1/10*
U.S. Cl. 36—7.3 **2 Claims**

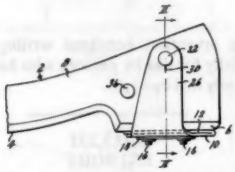
An overboot comprising a sleeve-like leg and an inner sole

of thin flexible rubber fabric and an outer sole of rubber, having a peripheral marginal portion which covers the seam



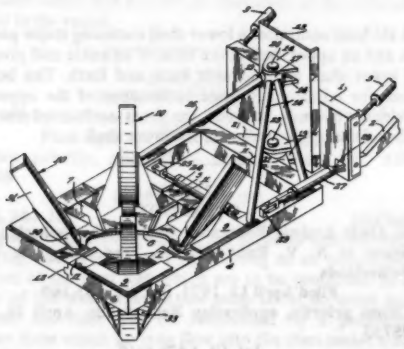
between the leg and the inner sole, said overboot being adapted to be folded to a small package.

3,713,233
SAFETY FOOTWEAR
Cecil C. Hunnicutt, 206 Harrison St., Sabetha, Kans.
Filed April 29, 1971, Ser. No. 138,607
Int. Cl. A43c *15/00*
U.S. Cl. 36—61 **3 Claims**



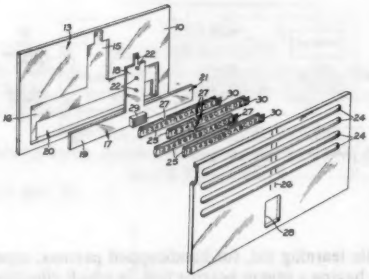
Safety footwear consisting of a shoe-like footwear member such as a rubber overshoe, a cleated member carried movably by said overshoe for movement between a use position in which the cleats thereof extend downwardly from the bottom of said overshoe and a storage position in which it is disposed above the bottom of said overshoe and exteriorly thereof, and fasteners for securing said cleated member selectively and releasably in either of said positions.

3,713,234
TRANSPLANTER WITH STRESS COMPENSATING BLADE GUIDE MEANS
Russell C. Grover, 1277 Cove Ave., Lakewood, Ohio, and Phillip C. Grover, 73 Long Common Rd. Apt. 1A, Riverside, Ill.
Filed Sept. 25, 1970, Ser. No. 75,583
Int. Cl. A01g *23/04*
U.S. Cl. 37—2 R **6 Claims**



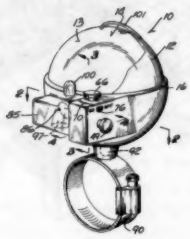
A transplanter for transferring a growing plant, shrub, tree, bush, or the like, from one location to another, the transplanter being equipped with cutting blades which converge when forced into the ground around the plant to prune the roots of the plant and sever a mass of earth around the remaining roots and retain the plant and earth mass until the same is placed in its new location, the transplanter also being usable to first provide a suitable hole for the reception of the mass of earth around the plant in the new location.

3,713,235
COMBINATION CREDIT CARD
Heinz Theodore Felix Roberts, Warren Street, Fleetwood, England
Filed Nov. 9, 1970, Ser. No. 87,884
Int. Cl. G09f *3/02*
U.S. Cl. 40—2.2 **2 Claims**



A credit card, security pass or like identification device in the form of a panel having a window therein, a display slide located beneath the panel for movements between an effective position (wherein a predetermined portion of the slide is in register with and exposed at the window) and an ineffective position (wherein the predetermined portion is out of register with the window and not visible therethrough) and a plurality of displaceable coded elements cooperating with the slide to prevent its movement to the effective position except in predetermined relative positions thereof.

3,713,236
MOTOR DRIVEN MAP VIEWER AND TRACKING DEVICE
Harold E. Fields, 1563-A West Lincoln Avenue, Milwaukee, Wis.
Filed April 5, 1971, Ser. No. 131,283
Int. Cl. G09f *11/10*
U.S. Cl. 40—33 **10 Claims**



A device to aid motorists in determining their position on a highway map includes a freely supported globe having a map of the area being traveled. The globe is moved by a motor driven magnetic drive wheel which tracks a route path or film traced on the selected route with a marker containing a supply of para-magnetic particles in a fast drying liquid or a paste car-

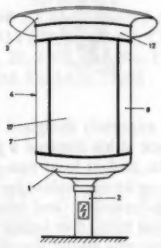
rier which is applied to the selected route with a marker prior to initiation of the trip. A motor speed control knob with a pointer and associated scale with vehicle speed indicia is preset or periodically adjusted to move the globe at a speed related to the scale of the map and corresponding to the vehicle speed to maintain the vehicle position on the route path in registry with a position indicating pointer on a magnifying viewing window.

3,713,237

ADVERTISING-PILLAR

Willy Thomson, Steilshooper Strasse 106, Hamburg 33, and Werner Carstens, Blockhorn 10, Hamburg 68, both of Germany

Filed Dec. 24, 1970, Ser. No. 101,378
Claims priority, application Germany, Jan. 2, 1970, P 70 00 018.9
Int. Cl. G09f *13/04*
U.S. Cl. 40—132 D **5 Claims**



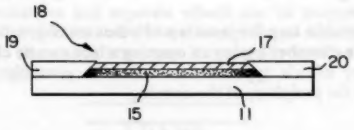
Advertising-pillar with a transparant substantially cylindrical wall illuminated from the interior and being divided into panels by vertical and, if any, horizontal strips provided with grooves for receiving windows and removable, advertising posters situated between two foils, the interior of the pillar being accessible through at least one of said windows.

3,713,238

POSTCARD INCLUDING PHOTOGRAPH MOUNTING MEANS

Herbert B. Hyman, 440 21st Place, Santa Monica, Calif., and John R. Gramont, Jr., 883 Wellesley Avenue, Los Angeles, Calif.

Filed Feb. 22, 1971, Ser. No. 117,233
Int. Cl. G09f *1/10*
U.S. Cl. 40—158 **2 Claims**



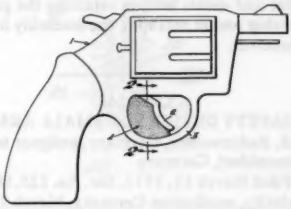
A postcard, for securely mounting a photograph, which includes a well portion having photograph mounting means located therein. The sides of the well portion are of the approximate thickness of the photograph so as to protect the photograph during the cancellation process. The photograph mounting means includes a sheet of adhesive for retaining the photograph and a sheet of non-adhesive material, which may be perforated, to allow all or a portion thereof to be removed in order to mount the photograph on the postcard.

3,713,239

TRIGGER SAFETY DEVICE

Robert Sperling, 256 N.E. 51 Street, Miami, Fla.

Filed Feb. 16, 1971, Ser. No. 115,482
Int. Cl. F41c *27/10*
U.S. Cl. 42—1 Y **5 Claims**



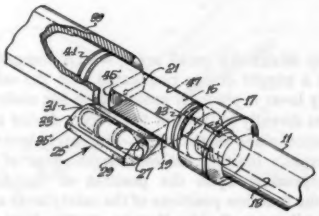
A trigger safety device for firearms particularly handguns. The trigger safety device is especially useful for police revolvers and consists of a solid shaped resilient plug to fit behind the trigger of a firearm.

3,713,240

LOCKLESS FIREARM SYSTEM

Morris Goldin, Orange, Calif., assignor to Hughes Tool Co., Aircraft Division, Culver City, Calif.

Filed June 5, 1970, Ser. No. 43,834
Int. Cl. F41c *11/00*; F41f *11/00*; F42b *5/18*
U.S. Cl. 42—15 **11 Claims**



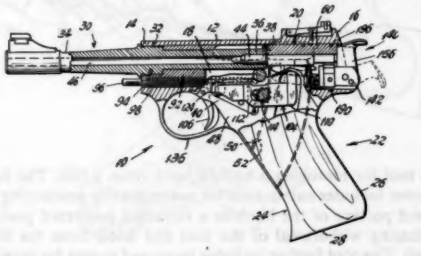
A firearm breech comprising a cylindrical breech section with a chamber cut through it to form a slot between a pair of straps which are integral with the portions of the firearm at the axial ends of the chamber. The chamber may be closed by an axially slidable sleeve which also thereby encloses the straps; the structure results in the elimination of all conventional gun locking structure.

3,713,241

STRIKER ASSEMBLY FOR FIREARMS

Ralf E. Dieckmann, 3 Eleanor Street, Stratford, Conn.

Filed Feb. 11, 1970, Ser. No. 10,531
Int. Cl. F41c *19/00*; F41d *11/02*
U.S. Cl. 42—69 B **17 Claims**



A striker assembly for firearms which is bodily removable as an integral assembly from the receiver of the firearm without

the need for disassembly of any other parts of the firearm. A body member supports a pivotally mounted spring loaded hammer and a pivotally mounted spring loaded sear, both of which are removably mounted on the body member, and there are cooperating locking means on the receiver and body member engageable in response to insertion of the assembly into the receiver. An ejector element is also mounted on the body member and assists both in retaining the parts in assembled relationship and in retaining the assembly in a fixed position in the receiver.

3,713,242

SAFETY DEVICE FOR SMALL ARMS

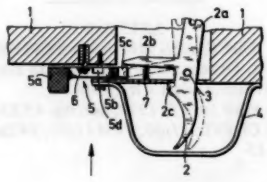
Paul Seifried, Badenweiller, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed March 11, 1971, Ser. No. 123,183

Claims priority, application Germany, March 21, 1970, P 20 13 766.0

Int. Cl. F41c *17/02*

U.S. Cl. 42—70 E **5 Claims**



A safety device for small arms, which comprises a safety lever and a trigger device connected with the safety device. The safety lever is pivotally mounted on the underside of the small arms directly in front of the trigger device crosswise to the operation plane of the latter. The safety lever includes a part differently limiting the movement range of the trigger device depending upon the position of the safety lever, whereby the function positions of the safety lever are disposed symmetrically on both sides thereto, starting from the vertical median plane of the small arms.

3,713,243

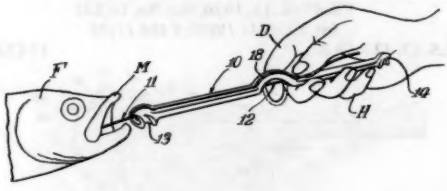
FISH HOOK REMOVER

Siegfried K. Tetzner, 5307 West Lake Shore Drive, Wonder Lake, Ill.

Filed Jan. 27, 1971, Ser. No. 110,177

Int. Cl. A01k *97/00*

U.S. Cl. 43—53.5 **11 Claims**



A tool for removing a barbed hook from a fish. The hook remover includes cam means for automatically positioning the barbed portion of the hook in a retracted protected position facilitating withdrawal of the tool and hook from the fish's mouth. The tool further includes improved means for manipulating the line attached to the hook during the removal operation.

3,713,244

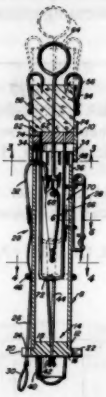
FISHHOOK CADDY

Renard M. Alotta, 2418 Phillips Road, Castleton, N.Y.

Filed Feb. 23, 1971, Ser. No. 117,972

Int. Cl. A01k *97/06*

U.S. Cl. 43—57.5 R **8 Claims**



A buoyant caddy expressly designed and adapted to serve an angler and to place at his disposal a plurality of loose fishhooks, snelled hooks, and at least one encased and shielded hook-equipped plug or an equivalent lure and to maintain the same systematically oriented and readily accessible and without fear of injuring himself or losing such accessories. The caddy comprises, generally stated, a pair of sleeves having adjacent inner ends telescopingly but separably connected and equipped with facilities to achieve the multipurpose result desired.

3,713,245

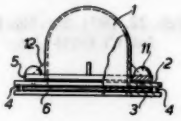
INSECT CATCHERS

Patrick Bruce Hovey, 78, Brookman's Avenue, Brookmans Park, Hatfield, England

Filed Dec. 30, 1970, Ser. No. 102,683

Int. Cl. A01m *1/10, 3/00*

U.S. Cl. 43—110 **7 Claims**



A portable trap for insects and other small creatures comprising a chamber having an opening which can be closed by a plurality of iris type shutter members pivotally mounted around the periphery of the opening.

3,713,246

CONSTRUCTION SET INCLUDING HEADED FASTENER WITH SHOULDER THEREON

Eugene J. Kilroy, Jr., Inglewood, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

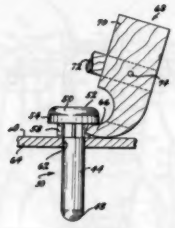
Filed June 30, 1971, Ser. No. 158,319

Int. Cl. A63h *33/10*

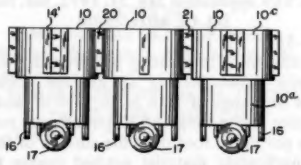
U.S. Cl. 46—17 **1 Claim**

A construction set including a connector for connecting toy play pieces thereof together or for serving as a simulated nail which may be driven into an aperture provided in one of the play pieces includes a hollow, elliptical body member having a

closed end and a headed open end. A shoulder is formed by gussets located in the head and extending along the shank to a point below the head, whereby the simulated nail will, when driven, bottom out on the shoulder instead of the headed end



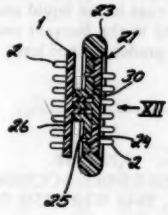
3,713,247
BOTTLE TOP ATTACHMENT AND TOY
Salvatore C. Parrilla, 811 Literary Road, Cleveland, Ohio
Filed Aug. 20, 1971, Ser. No. 173,576
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 **5 Claims**



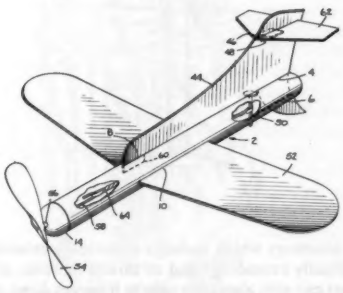
A combined bottle top attachment and toy is formed as a hollow cup having a cylindrical recess adapted, when the cup is upside down on the top of a bottle, to fit snugly around a crown cap closure on a soft drink bottle or the like, at which time a bore of greater diameter extending away from the cup bottom rests firmly against the neck of the bottle. Each cup has a pair of tongue and groove formations arranged on diameters at right angles to each other with the tongue at one end of the diameter and the groove at the other end and adapted to snugly fit into formations of like character on another cup. These tongue and groove formations extend radially outwardly from the cup surface at its greater diameter and are parallel to the axis of the cup, so that a plurality of the cups may be joined endlessly to each other along either or both of the diameters. Projections extend axially outwardly from the bottom of the cup on the same diameters as the tongue and groove formations and separate wheels can be snapped into these axial projections so that each cup forms a small cart. Preferably, the entire structure is integrally molded from plastic or the like.

3,713,248
WHEEL ELEMENT FOR TOY BUILDING SET
Walter Heubl, Munchner Str. 41, 8852 Rain am Lech, Germany
Continuation-in-part of Ser. No. 764,376, Sept. 30, 1968, Pat. No. 3,603,025. This application May 3, 1971, Ser. No. 139,574
Int. Cl. A63h *33/04*
U.S. Cl. 46—23 **14 Claims**

A wheel element for a toy building set has a substantially flat body from whose one face projects a plurality of equispaced parallel pins arranged in a plurality of mutually orthogonal rows and spaced apart by a distance corresponding to the pin diameter. The body has a circular periphery formed with an edge channel that acts as a seat for a tire ring. This ring is able to slide in the channel for use of the body as a wheel or the body can be constituted of two mutually rotatable members, one formed with the seat and one adapted to be anchored to some structure. It is also possible to provide both members with axially projecting oppositely directed connecting pins to allow the wheel to be used as a bearing between two structures. To this end the member carrying the tire can be formed of a pair of disks, one of which is annular and is provided with connecting pins over all of one face.

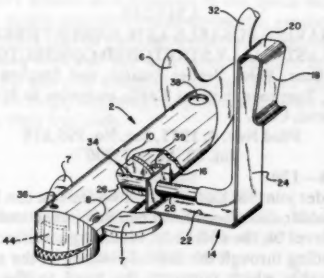


3,713,249
TOY SUBMARINE CONVERTIBLE TO AN AIRPLANE
Harold Goodman, 590 Ocean Avenue, Long Branch, N.J.
Filed March 13, 1972, Ser. No. 234,141
Int. Cl. A63h *27/00, 23/04*
U.S. Cl. 46—74 R **8 Claims**



A toy submarine having an open cylindrical hull section with forward mounted propulsion means adapted to accommodate both submarine and airplane components.

3,713,250
AQUATIC TOY
Roy L. Clough, Jr., Bristol, N.H., assignor to Xodar Corporation, Warwick, R.I.
Filed April 21, 1972, Ser. No. 246,227
Int. Cl. A63h *23/10*
U.S. Cl. 46—92 **6 Claims**



The invention is a toy for use in a body of water, e.g., a bathtub, a pool or the like. The toy comprises a body typically

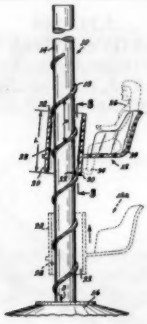
in the shape of submarine, fish or aquatic mammal, e.g., a whale. The toy normally has a negative buoyancy in water and is pivotally mounted in water with its pivot point located intermediate its ends. Means are provided for feeding air to the lower side of one end of the body. The body is adapted to trap sufficient air to impart positive buoyancy to that end, whereupon the buoyant end rises in the liquid and causes the toy to pivot. The gas trapped in the buoyant end is released when that end has risen to a predetermined level.

3,713,251

SPIN POLE DOLL ACCESSORY

Gabriel Marason, Jr., 1646 West 105th Street, Los Angeles, Calif.

Filed Sept. 24, 1971, Ser. No. 183,393
Int. Cl. A63h *11/04*
U.S. Cl. 46—132 **5 Claims**



A doll accessory which includes a vertically extending pole with a helically extending band or thread thereon, and a doll carrier that can spin about the pole as it moves down along the helical band, to provide an interesting ride for a doll thereon. The carrier has a tubular portion surrounding the pole and band and has an inwardly extending lug for riding on the band. The tubular portion is large enough so that it can be tilted to disengage the lug from the band, thereby permitting the carrier to be moved up along the pole by a child. A doll seat on the carrier is located on a side of the tubular portion, which is chosen to urge the carrier to tilt so that the lug remains engaged with the band.

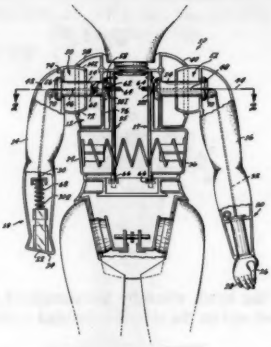
3,713,252

DOLL HAVING POSABLE ARM JOINED THERETO BY ELASTICALLY STRETCHED CONNECTOR

David L. Bear, Palos Verdes Estates, and Stephen W. Piurkowsky, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 4, 1971, Ser. No. 195,610
Int. Cl. A63h *13/00*
U.S. Cl. 46—120 **1 Claim**

A shoulder joint for a use in a doll whose arm can be pivoted at the shoulder and whose hand can be opened and closed by moving a lever on the doll body, including a connector with a hole extending through the axis of pivoting of the arm on the body. A cable which connects the hand to the operating mechanism on the body, extends through the hole in the connector, so that tension in the cable is not changed when the arm pivots. The connector is constructed of rubber and installed in a stretched condition, so that it forces surfaces of the



arm and body into contact to create friction that permits posing of the arm in a variety of positions.

3,713,253

TREATMENT OF SOIL

Urban A. Urban, Rte. 1, Box 163A, Menasha, Wis.

Continuation-in-part of Ser. No. 879,569, Nov. 24, 1969, abandoned. This application Jan. 24, 1972, Ser. No. 220,298
Int. Cl. A01b *79/00*
U.S. Cl. 47—58 **3 Claims**

Soil is treated prior to planting by spreading water-insoluble, polyolefin pellets having an average cross sectional dimension in the range of 1/16 in. to 3/16 in. and having an average density in the range of 30 pounds per cubic foot to 37.5 pounds per cubic foot over the surface of the soil. The amount of particulate material applied ranges from 0.010 pounds to 0.035 pounds per square foot of soil surface area, as indicated by type of soil and degree of compaction. The soil is then worked so that the polyolefin particles are distributed uniformly within the soil to a depth in the order to about 6 to 8 inches below the surface. The method promotes seed germination, allows faster plant growth, provides more efficient use of moisture and nutrients, reduces erosion and crustation, and thus improves crop yields.

3,713,254

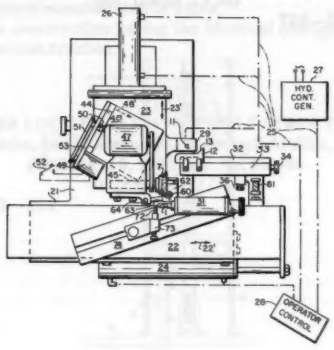
CONTROLLED TOOL FOR MACHINING COMPOUND SURFACES

Thurston V. Williams, Wilton, and Leo H. Cheever, South Lyndeboro, both of N.H., assignors to The O. K. Tool Company, Inc.

Filed May 14, 1971, Ser. No. 143,557
Int. Cl. B24b *3/06*
U.S. Cl. 51—34 A **6 Claims**

A machine tool with a wheel for precision grinding of a ball end mill with cylindrically surfaced lands and a hemispherical end includes a template conforming to the lands and ball end mounted on a hydraulic driven workpiece table on which the ball end mill is held in a rotatable chuck. The grinding wheel is mounted on another hydraulically driven table, relative movement of the tables being hydraulically controlled by a stylus which senses the template. During grinding the ball end mill is supported and rotated by a finger mounted on the grinding wheel table which engages in the flutes between the lands of the ball end mill closely adjacent the wheel. The wheel grinds along the lands and then as grinding continues around the ball end a sliding block supporting the finger engages a stop on the workpiece table and retracts the finger from the path of the wheel around the ball end. To maintain the same spacial relation between the wearing edge of the wheel and the ball end mill as the stylus has with the workpiece template, the wheel is dressed with a truing tool on the workpiece table under the

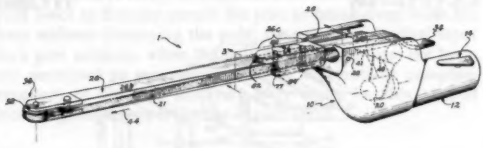
control of a dressing template. The grinding wheel is first advanced toward the truing tool by a stepping motor independently of the hydraulic table drive so that when the wearing edge is trued, the original spacial relationship of wearing edge and ball end mill is restored.



3,713,255
MINIATURE BELT GRINDER

Walter N. Welsch, Tonawanda, N.Y., assignor to Dynabrade, Inc., N. Tonawanda, N.Y.

Filed Sept. 29, 1971, Ser. No. 184,794
Int. Cl. B24b *23/00, 21/00*
U.S. Cl. 51—170 EB **2 Claims**



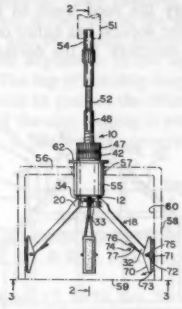
A hand tool grinder having an endless belt entrained about non-parallel drive and idler pulleys such that the flights thereof pass over a pair of crown-surfaced direction change pulleys featuring the interchangeable mounting of idler pulleys having differing diameters and axial lengths on the end of a pivotally supported arm; the construction of the arm adjustably accommodating for differing idler pulley diameters and belt lengths.

3,713,256
ADJUSTABLE GRINDING TOOL FOR BRAKE CYLINDERS AND THE LIKE

Alex Besenbruch, Greenlawn, and Arthur R. Hofmann, Huntington, both of N.Y., assignors to Besenbruch Hofmann, Inc., Lindenhurst, N.Y.

Filed Oct. 28, 1971, Ser. No. 193,359
Int. Cl. B24b *5/08*
U.S. Cl. 51—353 **10 Claims**

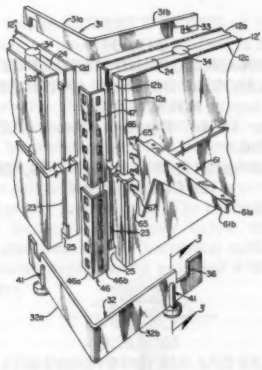
A grinding tool has a hollow hub at one end to which is pivotally mounted three arms each of which carries a pivotable shoe having mounted thereon a grinding stone. The arms may be radially contracted and held by an axially movable sleeve on the hub which has a radial annular flange serving as an abutment to limit axial advance of the tool in a cylinder being ground. A spring catch member on each of the shoes engages a camming edge of a hole in the arm to disengage the shoes. An adjustment means for setting the maximum radial expansion of the arm includes a spring loaded plug in the hub bearing on notches in the ends of the arm.



3,713,257
FREE-STANDING PANEL SYSTEM

Jack L. Beavers, Boulder, Colo., assignor to Design Products, Inc., Boulder, Colo.

Filed Oct. 19, 1970, Ser. No. 81,816
Int. Cl. E04b *2/78*
U.S. Cl. 52—36 **12 Claims**



A panel system is disclosed for partitioning a room area and releasably supporting selected articles of furniture in which the panels are provided with cooperating grooves and male locking elements in their outer edges and slotted top and bottom junction plates are releasably inserted into locking engagement with the top and bottom grooves, respectively, to position connected panels in closely spaced, edge-to-edge relation to one another. A spline is releasably inserted in adjacent vertical grooves of the connected panels and the spline has vertically spaced slots disposed in the space between the connected panels into which male connector projections on a support bracket may be releasably inserted to support shelves, cabinets, desk tops and like articles of furniture at a desired elevation. An end post assembly also has slotted top and bottom plates lockingly engaging the panels to provide additional support for their free ends.

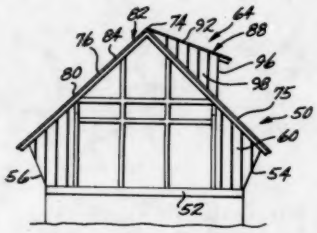
3,713,258
BUILDING STRUCTURE

Einar Svensson, 2248 N.W. 190th Place, Seattle, Wash.

Filed Oct. 15, 1970, Ser. No. 81,075
Int. Cl. E04b *7/18*
U.S. Cl. 52—90 **4 Claims**

A building structure adapted for erection as a prefabricated house. The building has a gabled roof section and a dormer

roof section with a second story, the primary loads of the roof structure being supported by two longitudinal second floor main support beams which are in turn supported by vertical columns which carry the roof loads to supporting ground structure. The dormer section has either one or two dormers formed in the roof structure. In the dormer section the roof



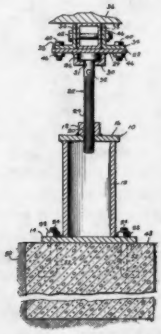
supporting structure is modified to include a dormer ridge beam supported at the ends, with the dormer roof loads being carried partly to the second floor main beam through a dormer wall and partly by the dormer ridge beam. Through the length of the house, the roof extends below the second floor level and joins to the house sidewalls which are canted upwardly and outwardly from the first floor level.

3,713,259

COMBINATION ANCHOR AND SUPPORT UTILIZED TO SECURE A MOBILE HOME TO AN UNDERLYING FOUNDATION

George Tkach, 15314 Harrison Road, P.O. Box 96, Mishawaka, Ind.

Filed April 16, 1971, Ser. No. 134,585
Int. Cl. E04g 25/04
U.S. Cl. 51—111 3 Claims



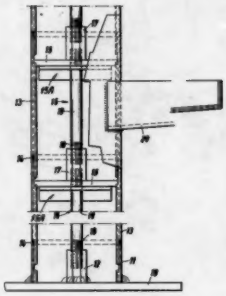
A combination anchor and support which is utilized to secure a mobile home to an underlying foundation and which includes a housing having a base anchored to the underlying foundation and a top wall spaced from the base. The top wall of the housing has an internally threaded opening therein which receives in threaded engagement an adjustment bolt having a head. The bolt can be rotated so as to cause its longitudinal movement relative to the housing and a variation in the spacing between its head and the top wall of the housing. A mounting plate, which is attached to the mobile home, is carried by the head of the bolt in such a manner as to permit rotation of the bolt relative to the plate.

3,713,260

SPINDLE STAIRCASE

Johannes Brauckmann, Bergstrasse 14, Schoppingen, Germany

Filed Aug. 12, 1971, Ser. No. 171,117
Int. Cl. E04f 11/00
U.S. Cl. 52—187 6 Claims



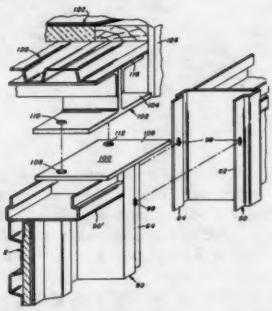
A spindle staircase is provided including a plurality of vertical sleeves nesting into one another and forming internal grooves. Within the grooves are positioned compression plates through each of which passes a stud bolt engaged by a nut above the plate and engaging another nut disposed beneath the plate.

3,713,261

BUILDING CONSTRUCTION

Donald H. Landis, Pittsburgh, Pa., and Richard C. Pfaff, Murrysville, Pa., assignors to Epic Metals Corp., Rankin, Pa.

Filed March 8, 1971, Ser. No. 122,046
Int. Cl. E04b 5/10; E04c 2/34
U.S. Cl. 52—289 11 Claims



A building construction having a panel assembly provided with an inner panel, an outer panel and an interposed insulating panel. The inner panel has a plurality of horizontally disposed, integrally formed hollow girt elements. Opposed vertical marginal edges of the panel assembly are secured to hollow columns. Each hollow column is formed from a pair of generally channel shaped column forming sections having substantially the same cross sectional configuration. Joining means securing each panel assembly vertical marginal edge to one column forming section. Each column forming section having a base element and two spaced upstanding sidewalls integrally connected therewith and disposed substantially perpendicular thereto. Each sidewall having a transversely inwardly disposed portion adjacent the free end thereof. The column forming sections disposed with their channel openings facing each other and the transversely inwardly disposed portions of one column forming section disposed in surface to surface contact with respect to the transversely inwardly disposed

portions of the other column forming section. This provides a generally rectangular hollow column member having fastener receiving recesses within a pair of opposed walls. The columns may have cap and sill plates enclosing the ends of the hollow section. The cap section may be employed to support an overlying structural member such as a joist.

A beam construction having the identical configuration as the column construction.

3,713,262

TAPER LOCK BREAK-AWAY POLE STRUCTURE

Joseph Jatcko, 24121 Mound Road, Bloomfield Hills, Mich.

Filed Dec. 10, 1970, Ser. No. 96,696
Int. Cl. E02d 27/42
U.S. Cl. 52—296 **4 Claims**

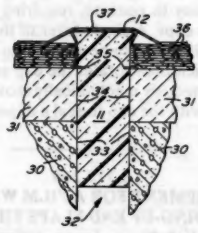
A pole structure such as for signs or utility installations is composed of a plurality of tubular tapered sections locked one to each other in telescoping fashion; the lowest section of the pole structure has a flange which is releasably attached to an inground base support of the pole by means of pivot clamps and/or shear pins which are adapted to give way or break when the pole is hit by an object at a certain magnitude of impact force to thereby permit the pole to break-away from the base without destroying the pole; the several individual taper lock pole sections, when the pole breaks-away from the base, are permitted to separate, permitting substantially complete recovery of the pole structure after being forcibly yanked from its ground support by the impact force.

3,713,263

EXPANSION JOINTS FOR ROOFS

William T. Mullen, 65 West Street Road, Wyncote, Pa.

Continuation-in-part of Ser. No. 848,251, Aug. 7, 1969, abandoned. This application May 7, 1971, Ser. No. 141,271
Int. Cl. E04b 1/68
U.S. Cl. 52—403 **3 Claims**



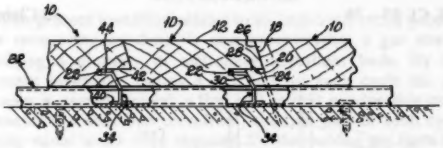
A roof joint construction is provided which includes an insertable precompressed expansible elongated filler or core element of open cell polyurethane or the like, with an impregnant, for insertion at joints in a roof deck for engagement with the roof, the insulation on the roof and the roof deck. The filler or core is preferably held, prior to use, in a compressed condition in any desired manner, such as by a cartridge, cartridge and cap or by a vacuum packing, with interposed release sheets, if desired. Upon removal for installation the filler or core element is inserted to the desired depth at the space at the joint, and restrained against further downward movement while the expansion in the space and above the space takes place. The top of the strip may have an elastic and flexible cover thereon to protect the filler or core. Before or after the removal of the cap, if a cap is employed, the roofing covering is applied. A final roofing covering may be used over the joint, if desired.

3,713,264

FLOORING SYSTEM

William R. Morgan, Jr., R.R. 2, P.O. Box 106 G, Long Grove, Ill.

Filed Sept. 17, 1970, Ser. No. 73,086
Int. Cl. E04b 5/00
U.S. Cl. 52—489 **1 Claim**



A flooring system including a plurality of flooring boards, each comprising an upper wearing surface, a bottom surface, and longitudinally extending sides. The boards are located in side-by-side relationship on a support with clips having engaging fingers securing the boards on the support. Each side of the boards defines a surface portion extending angularly downwardly, horizontally and then downwardly to provide a mating configuration with an adjacent board. A groove is formed in one side of the board, and this groove is adapted to receive a finger of a securing clip. The horizontally extending surfaces are located substantially below center, and the groove is located beneath the horizontal surfaces whereby a maximum wearing depth can be provided with a minimum of board thickness.

3,713,265

METHOD FOR CONSTRUCTION AND ERECTION OF FLOOR SLABS

Jerzy Wysocki, and Zygmunt Wysocki, both of 424 Benefit Street, Providence, R.I.

Filed Dec. 14, 1970, Ser. No. 97,728
Int. Cl. E04g 21/14; E04b 1/343
U.S. Cl. 52—745 **4 Claims**

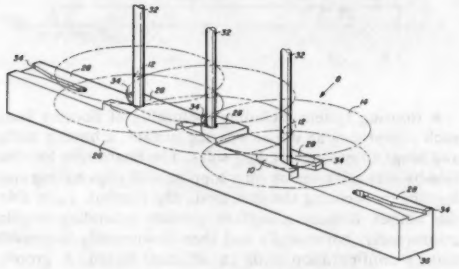
The method of constructing and elevating a building floor slab which comprises the utilization of a frame in the center of

the floor slab to which a plurality of sections, such as four sections, are hinged or flexibly connected and then moving the sections about their connection to the frame into a contracted position in plan view of the slab and then elevating the slab to the desired height and then expanding the slab and positioning it on the framework of the building and then subsequently elevating similar slabs by cables passing through the center frame of the slab as a hoistway to position additional slabs below the uppermost slab. In some cases the top slab may be used as a roof.

3,713,266
APPARATUS AND METHOD FOR PACKAGING FLANGED REELS

Rufus C. Crow, Jr., and Adrian C. Runions, both of Rochester, N.Y., assignors to Eastman Kodak Co., Rochester, N.Y.

Filed March 10, 1971, Ser. No. 122,950
Int. Cl. B65b *35/30*
U.S. Cl. 53—26 **13 Claims**



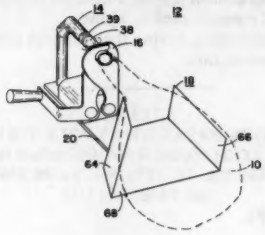
An apparatus and method for packaging stacks of reels of the type having a hub with an axial bore therethrough and circular flanges secured to the hub ends. In one embodiment, the fixture has a plurality of slidably mounted bars having stepped reel supporting surfaces of varying height. In another embodiment, the apparatus has a rectangular or square reel supporting fixture in which the reel supporting surface is provided with recesses and raised portions between the recesses. Each recess, raised portion or stepped surface has a guide opening to facilitate the loading of a plurality of rows of stacked reels on the fixture with the reel flanges in adjacent stacks arranged in interleaved or nested relation due to the difference in elevation or distance between adjacent reel supporting surfaces. The method of packaging the reels comprises placing a stack of reels on a guide rod, loading the stacks of reels and guide rods, preferably one stack at a time, on the fixture in interleaved relation, placing an inverted box over a full load of the stacks of reels, removing the guide rods from the stacks of reels, and inverting the fixture and box loaded with reels.

3,713,267
CLAMP AND TENSIONING MEANS FOR BAG NECKS AND THE LIKE

Woodrow R. Bowden, Jr., Greenville; Dave I. Owen, Wellford; Orville M. Calvert, Spartanburg, and Edward L. Holcombe, Taylors, all of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Dec. 14, 1970, Ser. No. 97,701
Int. Cl. B65b *31/04*
U.S. Cl. 53—112 B **3 Claims**

An apparatus and method for securing the open end of a bag neck over a conduit and tensioning the bag neck by holding the bagged product tensioned away from the securing means. In its preferred forms the securing means is a clamp including two arms that pivot to clamp a bag's neck portion against a conduit and are held in clamping position by a catch means at their outer ends. The arms are geared together for

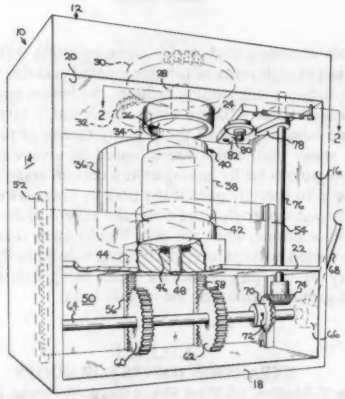


complimentary pivoting, biased to the open position, and open and close by pivoting across one another. The tensioning means is a chute having an inclined surface inclined away from the position where the bag is secured.

3,713,268
APPARATUS FOR SEALING CONTAINER CAPS

Larry C. Gess, 1255 Fir. Dr., Temperance, Mich.

Filed Dec. 7, 1970, Ser. No. 95,505
Int. Cl. B65b *7/28*
U.S. Cl. 53—334 **4 Claims**



Apparatus is provided for sealing caps of containers, such as bottles containing medicine. The apparatus is inexpensive, requires little maintenance, and is particularly adapted for sealing containers in quantities not large enough to require the use of an expensive, automatic machine. The apparatus also is compact and is easy to operate, requiring minimum force to seal the container caps. A single lever of the apparatus is used to raise a bottle with a cap to be sealed into engagement with a rotating head, which then rotates the cap as well as the bottle. The lever simultaneously mechanically moves a crimping head into engagement with the cap to seal a depending edge thereof as the cap rotates.

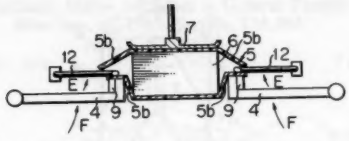
3,713,269
SEALING EQUIPMENT FOR A FILM WITH MEANS FOR HOLDING-UP END FLAPS THEREOF

Yoshimasa Sato, Yokohama, Japan, assignor to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1971, Ser. No. 140,488
Claims priority, application Japan, May 6, 1970, 45/43528
Int. Cl. B65b *7/06*
U.S. Cl. 53—373 **3 Claims**

A sealing equipment enclosed is directed to a seal of the end flaps of a film which has been already sealed along at least one

of opposed sides of an object to be packed. The sealing equipment comprises a pair of upper and lower seal bars movable into a sealing position where they pinch the end flaps of the film therebetween, and means for holding-up the end flaps to facilitate the sealing of the end flaps comprising a magnet member provided at least on the lower seal bar, and a holding-



up member into a space defined by the end flaps and one end of the object before one of said seal bars is brought into the sealing position, said holding-up member being made of magnetic material so that when at least the lower seal bar with the magnet is moved into the sealing position, the holding-up member is attracted by the magnet member to hold up the end flaps of the film.

3,713,270
HYDROGEN DIFFUSION MEMBRANES

John P. G. Farr, Birmingham 15, Warwickshire, and Ivor Rex Harris, Birmingham 31, Warwickshire, both of England, assignors to National Research Development Corp., London, England

Claims priority, application Great Britain, May 27, 1970, 25512/70

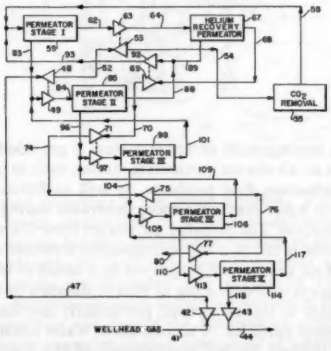
Filed May 24, 1971, Ser. No. 146,516
Int. Cl. B01d *59/12*; C22c *5/00*
U.S. Cl. 55—16 18 Claims

Membranes suitable for use in the separation of hydrogen from gaseous mixtures containing hydrogen, comprise an alloy of palladium and one or more elements selected from the group consisting of Yttrium and the Lanthanides but excluding Lanthanum and Praseodymium. Palladium-cerium and palladium-yttrium membranes are particularly suitable for use in the separation process.

3,713,271
PROCESS AND APPARATUS FOR RECOVERING A GAS CONSTITUENT BY MEMBRANE SEPARATION

William F. Franz, Gardiner, and Howard V. Hess, Glenham, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 9, 1970, Ser. No. 79,410
Int. Cl. B01d *59/10*
U.S. Cl. 55—16 5 Claims

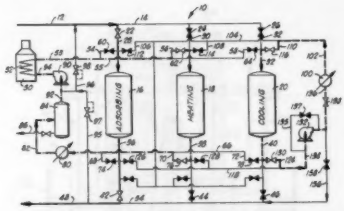


A process or system employing membrane separation to recover helium from a petroleum gas well. It includes pressure actuated compressing apparatus connected to the membrane separator so as to automatically compress the recovered helium.

3,713,272
PROCESS FOR RECOVERING CONDENSIBLE COMPONENTS FROM A GAS STREAM

Clem A. Barrere, Jr., Houston, Tex., and Burton M. Casad, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 26, 1971, Ser. No. 175,229
Int. Cl. B01d *53/04*
U.S. Cl. 55—33 12 Claims

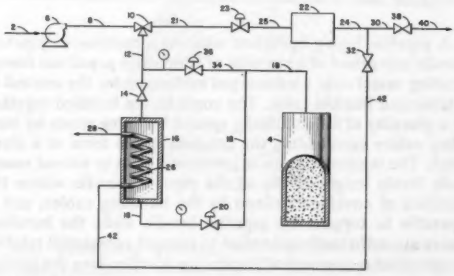


The present invention relates to an improved cyclic process for recovering condensible components from a gas stream utilizing a plurality of stationary absorbent beds. By the present invention, during a first part of each cycle the gas stream is passed through a first bed so that condensible components are absorbed therefrom, the first part of each cycle being equal to the time required for the residue gas from the first bed to reach a condensible component content of a predetermined level. A second bed is simultaneously cooled with a cooling gas stream which is confined within a closed circuit so that the second bed is prevented from becoming preloaded with condensible components during the cooling thereof. During the remainder of each cycle the gas stream is passed serially through the first and second beds so that additional condensible components are absorbed on the first bed and condensible components contained in the residue gas from the first bed are absorbed on the second bed. A third bed is heated and stripped during each cycle with a regeneration gas stream and condensible components are recovered from the regeneration gas stream.

3,713,273
METHOD AND APPARATUS FOR STORING GASES AND FUELING INTERNAL COMBUSTION ENGINES

Robert L. Coffee, 316 N. Cedar, Newkirk, Okla.

Filed May 3, 1971, Ser. No. 139,527
Int. Cl. B01d *53/04*
U.S. Cl. 55—75 10 Claims



An impure stream of fuel gas is purified by passing the stream through a sorbent body which absorbs the impurities. The purified stream is then absorbed under pressure in a tank containing a suitable absorbent. The fuel gas is subsequently released to an internal combustion machine or other consumer of fuel gas for burning. The heated exhaust gases are flowed through the first purifying sorbent body to heat it and vaporize the unwanted impurities thus regenerating the sorbent body for a new cycle.

3,713,274
APPARATUS FOR CONVEYING AND DEGASSING A VISCOUS LIQUID

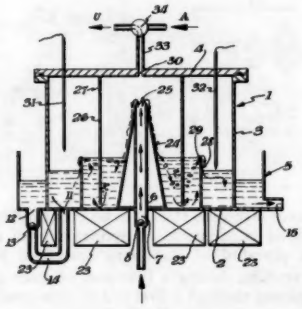
Theo Sauer, and Anton Riedel, both of Perutz Photowerke, Kistlerhofstr. 75, D-8000 Munich 25, Germany

Filed Sept. 10, 1970, Ser. No. 71,120

Claims priority, application Germany, Sept. 13, 1968, P 19 46 563.5

Int. Cl. B01d *19/00*

U.S. Cl. 55—164 **10 Claims**



An apparatus for conveying and degassing a viscous liquid from a storage tank to a mold shell by way of an intermediate container disposed higher than the mold shell including a further container between the intermediate container and the storage tank. At least one ultrasonic generator is provided as well as an automatic inlet valve which opens during ultrasound. An automatic outlet valve is also disposed between the intermediate and further containers to open when the further containers is under atmospheric pressure.

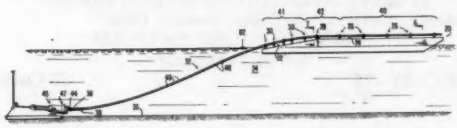
3,713,275
PIPELINE BUNDLE LAYING OPERATIONS

Alfred Ray Hyatt, Grest Yarmouth, England, assignor to Brown & Root Inc., Houston, Tex.

Filed Jan. 13, 1972, Ser. No. 217,546

Int. Cl. B63b *35/04*; F16l *1/00*; B65b *13/00*

U.S. Cl. 61—72.3 **8 Claims**



A pipeline laying operation wherein a continuous pipeline bundle comprised of a plurality of conduits is payed out from a floating vessel onto a submerged surface under the control of a tensioned flexible cable. The conduits are bundled together at a plurality of longitudinally spaced bundling zones by bundling cables surrounding the conduits in the form of a clove hitch. The tensioned cable is positioned so as to extend essentially freely longitudinally of the pipeline bundle within the confines of envelope defined by the bundling cables, and is operable to support the pipeline bundle while the bundling zones are sufficiently spaced as to prevent substantial relative longitudinal movement of thepipeline bundle along the cable.

3,713,276
POLLUTION CONTROL APPARATUS

John P. Heard, 1501 Doran, Odessa, Tex.

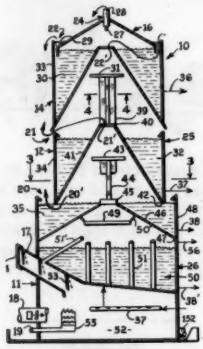
Filed May 19, 1971, Ser. No. 144,763

Int. Cl. B01d *47/12*

U.S. Cl. 55—222 **7 Claims**

Apparatus for separating suspended solids from a stream of gas, and for evaporating water, comprising a vertically disposed tower made up of a plurality of sections, each of which have associated therewith a tent-like structure for subjecting a stream of gas to a washing action. The lowermost section has a combustion chamber and boiler associated therewith. Flue gases from the combustion process are admixed with steam from the boiler and flow along a tortuous path up through the various sections of the tower.

As the gases ascend the tower, various portions thereof are split from the main flow and are subjected to a washing action, with the final remaining flow of gases emerging from the uppermost portion of the tower.



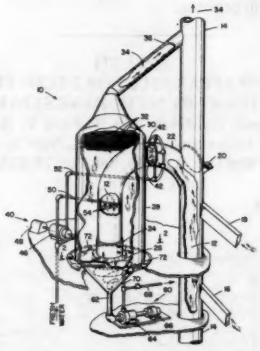
3,713,277
FOG IMPINGEMENT SCRUBBING SYSTEM

Walter J. Sackett, Sr., Severna Park, Md., assignor to The A. J. Sackett & Sons Company, Baltimore, Md.

Filed Jan. 15, 1971, Ser. No. 106,782

Int. Cl. B01d *47/06*

U.S. Cl. 55—223 **4 Claims**



A fog impingement scrubber system is provided for removing from an air stream particulate matter, such as product dust and combustion dust products, as well as fumes, and water soluble or water reactant vapors generated during a manufacturing process. The polluted air stream from the manufacturing process is fed to a fog impingement scrubber system. The polluted air stream is first sprayed by a series of high pressure water sprays to create a fog or mist to dampen or wet particulate matter in the air stream, particularly any fine or microscopic sized particles. A second set of water nozzles or sprays is then utilized further downstream of the fogging area to moisten the larger particles of particulate matter in the air stream. The sprayed polluted air stream is then impinged upon a whirlpool provided in the scrubbing system, where the moistened particles are removed from the air stream, and where the water soluble or water reactant vapors are treated.

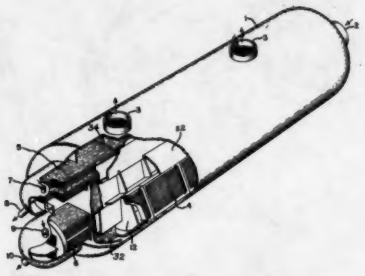
Any moisture in the air is then removed by a demisting system, and the clean air then discharged back to the atmosphere.

3,713,278

COMBINED MOISTURE SEPARATOR AND REHEATER

Edward H. Miller, Rexford, N.Y., and Stephen Chesmejef, South Portland, Maine, assignors to General Electric Co.

Filed Nov. 18, 1968, Ser. No. 776,365
Int. Cl. B01d *45/08*
U.S. Cl. 55—269 7 Claims



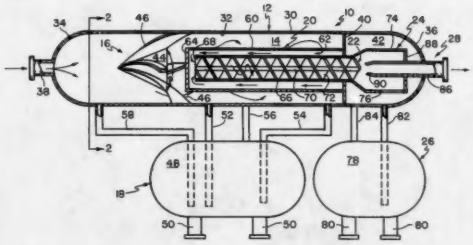
A combined moisture separator and reheater suitable for a nuclear steam turbine-generator powerplant, wherein a single shell houses two banks of "wiggle plate" inertial separators fed in parallel along either side of the shell and two stages of steam reheating tubes disposed to reheat the steam and arranged to cause uniform flow through the moisture separators.

3,713,279

GAS-LIQUID SEPARATOR

Lester P. Moore, P.O. Box 1762, Corpus Christi, Tex.

Continuation-in-part of Ser. No. 795,531, Jan. 31, 1969, Pat. No. 3,641,745. This application June 17, 1970, Ser. No. 46,934
Int. Cl. B01d *45/16*
U.S. Cl. 55—319 1 Claim



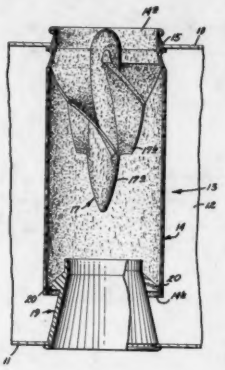
A gas-liquid separator is provided including a first liquid removing device comprised of a conical deflector having vanes thereon for swirling an inflowing stream of gas and entrained liquids onto the interior surface of a vessel. Liquid accumulating on the interior vessel wall is removed. The flow of gas and any further entrained liquids is reversed to flow in the upstream direction and then in the downstream direction into a second liquid removing section comprised of a helical screw in a conduit. As the gas and entrained liquids are helically moved through the conduit, the further entrained liquids are deposited on the conduit wall. Means are provided to remove the subsequent liquid accumulation and to allow exit of the gas from the separator.

3,713,280

CENTRIFUGAL AIR CLEANER WITH STATIC CHARGE DISSIPATING STRUCTURE

Darryl E. Keller, Mound, Minn., and Donald R. Monson, St. Paul, Minn., assignors to Donaldson Co. Inc., Minneapolis, Minn.

Filed May 17, 1971, Ser. No. 143,820
Int. Cl. B01d *45/14*
U.S. Cl. 55—360 10 Claims



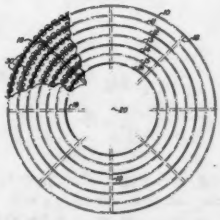
A tubular member is provided with means, such as vanes, to swirl air passing therethrough to centrifugally separate particles from the air. The tubular member and means are injection molded from plastic, preferably polypropylene, having aluminum or equivalent fibers well dispersed therein to dissipate through the walls of the tubular member the static charge being formed by the impact of randomly charged airborne particles on the inner wall surface thereof.

3,713,281

HEAT AND MOISTURE EXCHANGE PACKING

Gunnar C. F. Asker, and Maurice A. Hubscher, both of 18 Industrial Dr., Flemington, N.J.

Filed Nov. 2, 1971, Ser. No. 195,054
Int. Cl. B01d *53/04*
U.S. Cl. 55—387 15 Claims



Gas contacting packing, such as for moisture, heat exchange, catalytic contact and the like, said packing for gas using a metallic foraminous framework for heat or moisture exchange particles while allowing free flow of air thereabout for heat or moisture exchange particles while allowing free flow of air thereabout for optimum surface contact while providing a stable structure, the metallic support having woven wire framework disposed in layers or sheets which may be corrugated and of perforated metal, whereby air may pass both radially and axially in free-flowing contact with the particles.

3,713,282

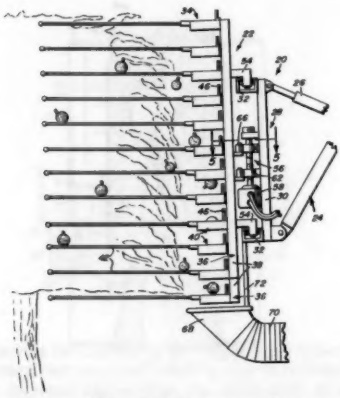
HARVESTING APPARATUS

Alfred R. Baker, 1408½ Edmiston Court, Auburndale, Fla.

Continuation-in-part of Ser. No. 735,116, June 6, 1968, Pat. No. 3,561,205. This application Nov. 4, 1970, Ser. No. 86,888The portion of the term of this patent subsequent to Feb. 9, 1988, has been disclaimed.

Int. Cl. A01g *19/04*

U.S. Cl. 56—328 R **8 Claims**



A harvesting or picking head incorporating a pair of interested sections mounted for reciprocation relative to each other. Each of the sections includes plural rows of projecting rods which coact with the rods of the other section so as to effect a snapping of the stems of mature fruit and a gentle movement of the severed fruit to a common collection point.

3,713,283

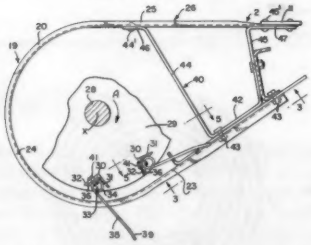
TINE GUIDING DEVICE FOR CROP PICK-UP

Edward A. Fritz, Hinsdale, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Feb. 9, 1972, Ser. No. 224,818

Int. Cl. A01d *89/00*

U.S. Cl. 56—364 **5 Claims**



In a crop pick-up having spaced stripper bars forming a plurality of channels through which pick-up tines extend to gather the crops, a device is located for shifting a deflected tine from an adjacent channel into its proper channel.

3,713,284

SWEEPER FOR GARDEN TRACTOR HAVING IMPROVED HITCH LINKAGE

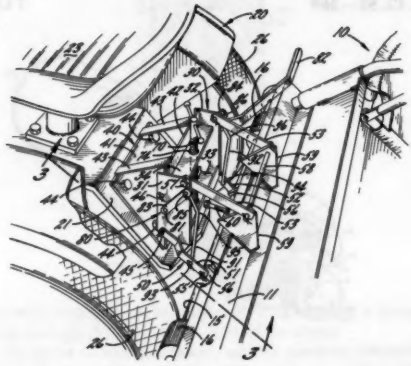
Douglas D. Dankel, and Norman O. Buckhouse, both of Kankakee, Ill., assignors to Roper Corporation, Kankakee, Ill.

Filed Jan. 10, 1972, Ser. No. 216,703

Int. Cl. A01d *87/08*

U.S. Cl. 56—364 **10 Claims**

A hitch for cantilevered support of a lawn sweeper on a tractor in which a vertically extending support member is mounted upon the tractor having a trailingly pivoted parallelogram-type hitch linkage pivoted to the frame of the sweeper. The lower links are downwardly angled so that the weight of the sweeper is effective to bring drive wheels on the sweeper into engagement with the backsides of the tractor rear wheels and so that when the draft linkage is raised there is a horizontal component to effect disengagement or "throw-off" of the drive wheels from the tractor wheels. Elevator linkage is provided for swinging the draft linkage upwardly and latching it into upraised transport position. For adjusting the working ground clearance of the brush, the supporting member is vertically movable with respect to the tractor and a jack screw is provided on the supporting member for locating it in a desired vertical position. A limit stop interposed between the sweeper frame and tractor limits the degree of indentation of the drive wheels into the tires on the rear wheels of the tractor.



3,713,285

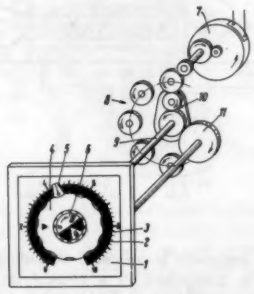
ELECTROMECHANICAL TIME RELAY

Werner Haufe, Berlin, Germany, assignor to Schleicher G.m.b.H. & Co. Relaisbau K.G., Berlin, Germany

Filed Oct. 27, 1970, Ser. No. 84,268

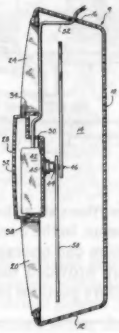
Int. Cl. G04f *3/06*

U.S. Cl. 58—39.5 **5 Claims**



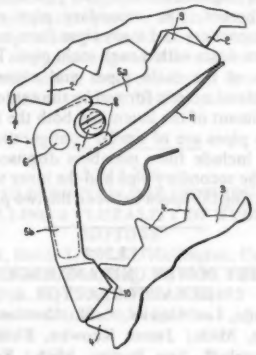
An electromechanical time delay device driven by a synchronous motor via a reduction gear system, in which a series of decadic time ranges can be preselected. A time delay required is selected with the chosen decadic range by means of an adjustor Knob associated with a time scale. Within each decadic range, the lower end of the scale can be expanded by the use of further reduction gears so that the effect of the inherent time error of the relay is minimized.

3,713,286
CLOCK
Charles E. Trame, Fox Point, Wis., assignor to Everbrite Electric Signs, Inc., South Milwaukee, Wis.
Filed April 5, 1972, Ser. No. 241,368
Int. Cl. G04b 37/00
U.S. Cl. 58—53 7 Claims



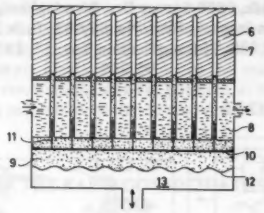
A clock frame has front supporting bars extending radially inwardly therefrom. A central panel which is substantially smaller than the clock frame is supported in the front central portion of the frame by the support bars, and a clock mechanism is attached to the central panel. The drive shafts of the clock mechanism extend rearwardly from the central panel and have a pair of hands attached thereto which project radially beyond the central panel so as to be visible from the front of the clock. The central panel covers all of the clock mechanism except the radially outer portions of the clock hands and may have advertising indicia thereon.

3,713,287
CALENDAR-WATCH
Kurt Vogt, Bienne, and Roland Maillard, Orpund, both of Switzerland, assignors to OMEGA Louis Brandt & Frere S. A., Bienne, Bern, Switzerland
Filed June 14, 1971, Ser. No. 152,804
Claims priority, application Switzerland, June 30, 1970, 9862/70
Int. Cl. G04b 19/24
U.S. Cl. 58—58 4 Claims



A calender watch movement comprises day and date indicators respectively having rings of teeth, a single jumper with two pawls respectively engaging said rings of teeth, and return spring means biasing said jumper to engage said pawls with said rings of teeth, said jumper comprising two parts, each carrying one of the pawls, which are relatively adjustable to assure the exact angular positions of said pawls.

3,713,288
ENERGY CONVERTER
Eleonoor Van Andel, Twekkelo, Netherlands, assignor to European Atomic Energy Community (Eurstom)
Filed July 8, 1970, Ser. No. 53,160
Claims priority, application Germany, July 21, 1969, P 19 37 645.5
Int. Cl. F03g 7/06
U.S. Cl. 60—25 5 Claims

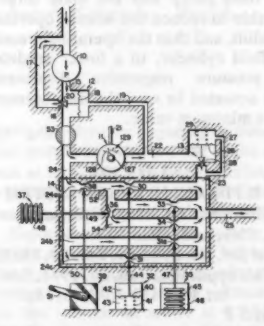


Thermo-mechanical energy converter which can be used as an artificial heart. The converter comprises a plutonium heat source, a plurality of parallel tubes open at one end to a diaphragm chamber and heated at the other end, an evaporable liquid filling completely the chamber and partially each tube, and a piston in each tube, all pistons being interconnected for synchronizing the evaporation-condensation cycles which are performed at the closed ends of the tubes. This converter produces directly from a temperature difference mechanical oscillation in a closed loop.

3,713,289
MOTIVE FLUIDS FOR EXTERNAL COMBUSTION ENGINES
George S. Somekh, New Rochelle, N.Y., assignor to Union Carbide Corp., New York, N.Y.
Continuation-in-part of Ser. No. 862,526, Sept. 30, 1969, abandoned. This application March 11, 1971, Ser. No. 123,434
Int. Cl. F01k 25/00
U.S. Cl. 60—36 19 Claims

A new class of motive fluids for external combustion engines characterized by a thermo-dynamic property which render them superior to water in external combustion engines.

3,713,290
GAS TURBINE ENGINE FUEL CONTROL
Harold Gold, Shaker Heights, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed May 28, 1971, Ser. No. 147,922
Int. Cl. F02c 9/04
U.S. Cl. 60—39.28 R 11 Claims



A variable orifice system that is responsive to compressor inlet pressure and temperature, compressor discharge pres-

sure and rotational speed of a gas-turbine engine is incorporated into a hydraulic circuit that includes a zero gradient pump driven at a speed proportional to the speed of the engine. The resulting system provides control of fuel rate for starting, steady running, acceleration and deceleration under varying altitudes and flight speeds.

3,713,291

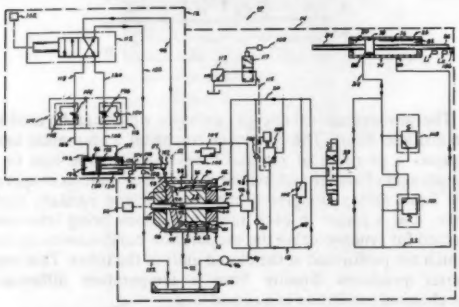
MULTIPLE PRESSURE FLUID SYSTEM

Philip A. Kubik, 6809 Spruce Dr., Birmingham, Mich.

Continuation-in-part of Ser. No. 50,093, June 26, 1970, Pat. No. 3,653,208. This application Nov. 23, 1970, Ser. No. 91,949

Int. Cl. F15b *15/18*

U.S. Cl. 60—52 VS **8 Claims**



A fluid system having a variable displacement fluid direct fluid in a closed loop circuit to a fluid cylinder having a piston and a pair of connecting rods extending from opposite sides of the piston externally of the fluid cylinder. A main directional control valve disposed in the closed circuit between the inlet and outlet of the fluid pump is adapted to selectively direct fluid to one side of the piston within the fluid cylinder, while exhausting fluid from the other side of the piston, to selectively move the piston within the fluid cylinder. The rate of movement of the piston in either direction of movement is controlled by the amount of fluid displaced by the fluid pump.

A second directional control valve is adapted to fluid FLUID from a second source of fluid to a pressure responsive displacement control mechanism to selectively vary the displacement of the fluid pump between a maximum and a minimum value. The rate of fluid flow to the pressure responsive displacement control mechanism is selectively varied to control the rate of displacement of the fluid pump and to thereby selectively control the rate of movement of the cylinder piston.

A remotely controlled pilot operated pressure relief valve, having an inlet connection in fluid communication with the outlet conduit of the fluid pump upstream from the main directional control valve and an outlet connection in fluid communication with the inlet conduit of the fluid pump between the fluid pump and the main directional control valve, is operable to reduce the normal operating pressure in the outlet conduit, and thus the operating pressure of the fluid in the main fluid cylinder, to a lower predetermined value when the pressure responsive displacement control mechanism is actuated to vary the displacement of the fluid pump toward a minimum value.

3,713,292

HYDRAULIC BRAKE SYSTEM

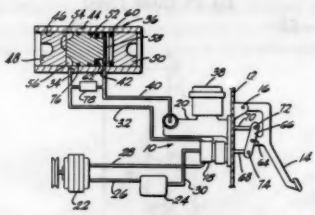
Herman M. Huffman, Owosso, Mich., assignor to Midland-Ross Corp., Cleveland, Ohio

Division of Ser. No. 800,589, Feb. 19, 1969, Pat. No. 3,635,025. This application Jan. 20, 1971, Ser. No. 108,165

Int. Cl. F15b *7/00, 15/18*

U.S. Cl. 60—54.5 P **4 Claims**

A dual power and manual hydraulic brake system for a motor vehicle including a fluid pressure operated mechanism for actuating wheel brake shoes or the like, a master cylinder containing a power or primary fluid pressure generating portion and a manual or secondary fluid pressure generating portion, and separate hydraulic circuits associated with the primary and secondary portions so as to provide separate power and manual brake systems. In the event of failure of one of the systems, the other system can operate independently thereof. Brake pedal means are provided for concurrently actuating the primary and secondary portions of the master cylinder.



3,713,293

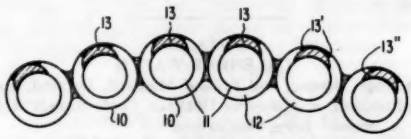
COMBUSTION CHAMBER AND NOZZLE ARRANGEMENT FOR A ROCKET ENGINE

Michael Simon, Hamburg-Othmarschen, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Germany

Division of Ser. No. 807,703, March 17, 1969, Pat. No. 3,644,974. This application Oct. 8, 1970, Ser. No. 79,250

Int. Cl. F02k *11/02*

U.S. Cl. 60—267 **15 Claims**



Combustion chamber and nozzle arrangement for a rocket engine having a plurality of main pipes bonded together to form an annular chamber having a nozzle configuration, and a secondary pipe disposed in each main pipe and secured to the inner walls thereof. The secondary pipe and the space between the secondary and main pipes form separate cooling feed and return ducts within each main pipe. The point of interconnection of the main pipes and secondary pipes is disposed outside of a circle formed by the centers of the pipes. In one embodiment of the invention, both the main pipes and the secondary pipes are of similar configuration. Alternative embodiments include filler members disposed between the outer wall of the secondary pipe and the inner wall of the main pipe for restricting the space between the two pipes.

3,713,294

AUXILLIARY POWER UNIT AND REGENERATIVE EXHAUST REACTOR

Otto Erich Balje, Los Angeles, Calif.; Constant L. Bouchard, Birmingham, Mich.; James Knowles, Bloomfield, Mich.; Dimitri Kosacheff, New Boston, Mich.; Emil A. Pulick, Livonia, Mich.; Michael A. Pulick, Livonia, Mich.; and Armen Topouzian, Birmingham, Mich., assignors to Ford Motor Co., Dearborn, Mich.

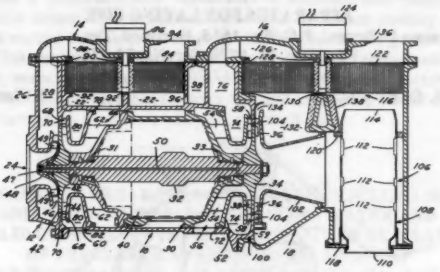
Filed Aug. 12, 1971, Ser. No. 171,229

Int. Cl. F01n *3/14*

U.S. Cl. 60—303 **20 Claims**

A housing contains a burner for combusting the exhaust gases of a reciprocating internal combustion engine to in-

crease the heat content thereof. Combustion products from the burner pass through a regenerator that transfers heat therefrom to inducted air for a turbine. The heated air passes through the turbine to produce useful work and then enters



the burner to mix with the exhaust gases of the reciprocating engine. An alternator mounted within the housing is driven by the turbine to supply electrical power. An air cycle air conditioning system also is mounted within the housing and its compressor is driven by the turbine.

3,713,295

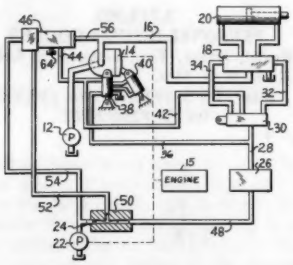
PRESSURE AND/OR FLOW COMPENSATING MEANS

Williard J. Haak, Peoria, and Howard A. Marsden, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed April 26, 1971, Ser. No. 137,164

Int. Cl. F15b *15/18*

U.S. Cl. 60—52 VS **4 Claims**



The control circuit of a high pressure work system powered by a variable displacement-positive displacement pump is provided with a compensating valve for controlling the pump displacement. The compensating valve is responsive to pressure in a control circuit and in the work circuit as well as to fluid flow in another circuit to alter the displacement of the work system pump.

3,713,296

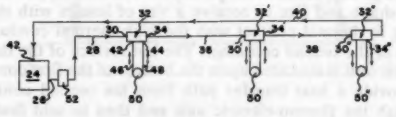
HYDRAULIC SYSTEM FOR INDIVIDUALLY CONTROLLING A PLURALITY OF HYDRAULIC MOTORS

Delbert L. Black, Route 1, Box 92, Wellington, Colo.

Division of Ser. No. 66,360, Aug. 24, 1970. This application Feb. 15, 1972, Ser. No. 226,453

Int. Cl. F15b *11/16*

U.S. Cl. 60—452 **3 Claims**



A hydraulic system for independently controlling a plurality of individual reversible variable speed hydraulic motors from a common pressure supply source. A plurality of control valves, one for each motor to be controlled, are connected in a closed series circuit with a pump which is operable to recirculate fluid under pressure through the circuit. Each valve, when located in a centered or neutral position, permits all fluid entering the valve inlet to pass directly to the valve outlet. Upon displacement from the neutral position, a portion of the flow into the valve inlet is diverted to the associated motor, passes through the motor and is returned to the valve to rejoin the nondiverted portion of the flow. The magnitude and direction of flow through the motor is dependent upon the magnitude and direction of displacement of the valve from its neutral position. Displacement of a valve in either direction beyond a selected maximum displacement blocks the inlet port of the valve and the resultant increase of pressure at the pump triggers a pressure responsive switch to shut down the pump.

3,713,297

PROCESS FOR THE RAPID CONSOLIDATION OF MOIST SOIL

Friedrich Hochbach, Glinde, Germany, assignor to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany

Filed June 17, 1971, Ser. No. 154,158

Claims priority, application Germany, June 19, 1970, P 20 30 217.4

Int. Cl. E02d *3/12*

U.S. Cl. 61—36 R **7 Claims**

The subject of the invention is a process for shaping and rapidly consolidating moist soil, characterized in that the moist soil is mixed with an excess amount of water-absorbent pulverulent varieties of gypsum for such period of time that a crumbly mixed product is obtained, which is then mixed with a mixture of polymerizable unsaturated polyesters, hardeners and accelerators to give a mass which can be shaped, and that this mass after being shaped does consolidate relatively fast.

3,713,298

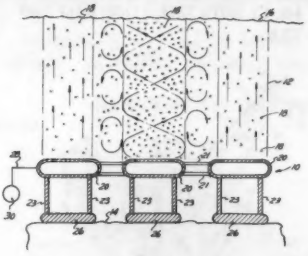
NAVIGABLE DAM

Morris Mendelson, 16156 Axley, Southfield, Mich.

Filed June 7, 1971, Ser. No. 150,426

Int. Cl. E02b *7/02*

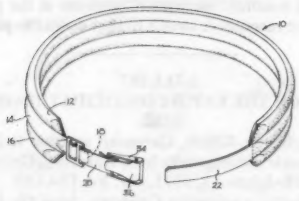
U.S. Cl. 61—30 **2 Claims**



A portable navigable dam for impeding or directing the flow of water without interfering with the use of the upper surface of the water such as for instance passage of sailing vessels. The navigable dam takes the form of a number of elongated tubular structures and in the preferred embodiment of this invention these are disposed on or near the bottom of a body of water generally paralleling the boundary between salt water and fresh water bodies. Each of the tubular structures has elongated openings formed in its upper surface for releasing air from within the tubular structure at a high rate, while preventing entry of water therethrough. The release of air into the water results in a pumping action that moves a very large

volume of water upwardly in a relatively short time, forming a curtain of water which impedes the movement of the salt water into the fresh water. A method incorporating the navigable dam for directing tidal waters in a desired direction is also disclosed.

3,713,299
DIVER'S WEIGHT BELT
Dana B. Duncan, 2290 Whitney Ave., Summerland, Calif.
Filed Oct. 24, 1969, Ser. No. 869,216
Int. Cl. B63c *11/30*
U.S. Cl. 61—70 **1 Claim**

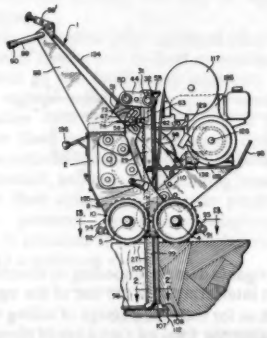


A weight belt for underwater divers comprising a plurality of connected elongated substantially circular in cross-section tubular compartments for containing lead weights, the compartments of the belt are formed of a flexible high strength cloth type of material, the length of the compartments are to extend in front of one hip of the wearer and around the back of the wearer and to the front of the other hip, the ends of the belt are joined together by a buckle assembly including a strap on one end and a safety type buckle on the other end.

ERRATUM

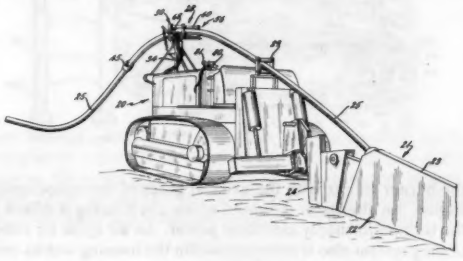
For Class 61—72 see:
Patent No. 3,713,275

3,713,300
CABLE LAYING DEVICE
Gerald G. Ward, Rt. 3, Box 303, Naperville, Ill.
Continuation-in-part of Ser. No. 828,821, Sept. 17, 1969. This application Nov. 19, 1971, Ser. No. 200,458
Int. Cl. A01b *3/64*, *11/00*; F16l *1/00*
U.S. Cl. 61—72.6 **17 Claims**



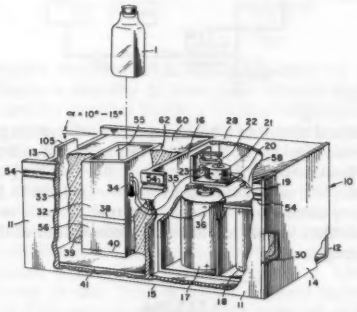
A cable layer unit comprising a tractive carrier with pairs of front and rear traction wheels, a digger blade which either meters or pulls a cable and disposed between the pairs of wheels, a drive for moving the blade in an elliptical path for slicing through the ground; a drive for raising and lowering the blade; and a pivot bar in front and rear of the unit upon which the unit is tilted to enter the blade into the ground close to a building and to raise the blade out of the ground close to a building.

3,713,301
APPARATUS FOR LAYING PIPE
Tommy L. Bryant, P.O. Box 1655, Hereford, Tex.
Filed Dec. 11, 1970, Ser. No. 97,236
Int. Cl. B65h *17/20*; F16l *1/00*
U.S. Cl. 61—72.6 **5 Claims**



Apparatus for laying pipe underground in a continuous process and usable with a heavy duty vehicle having a ditching plow attached thereto. The apparatus includes means for receiving lengths of pipe which are not positively connected together and forcing such lengths of pipe through the ditching plow in a manner that the pipe will remain in assembled relationship after such pipe has been laid.

3,713,302
PERSONAL INSULIN COOLER
Benny L. Reviel, Irving, Tex., assignor to Lek Trol Incorporated, Rosewell, N. Mex.
Filed May 3, 1971, Ser. No. 139,338
Int. Cl. F25b *21/02*
U.S. Cl. 62—3 **5 Claims**



A first container of a size to be carried on a person's body or in a small case of high thermal conductivity material is partitioned into first and second compartments with a battery source positioned in the first compartment, and the assembly of a second container, also of high thermal conductivity, mounted upon the cold surface of a thermo-electric unit, positioned in said second compartment. The second container is of a shape and size to receive a vial of insulin with the vial being in thermal contact with the high thermal conductivity walls of the second container. The hot surface of the thermo-electric unit is mounted upon the bottom of the first container to provide a heat transfer path from the second container, through the thermo-electric unit and then to said first container, which functions to dissipate the heat into the ambient

environment. Insulating means is firmly packed between the inside walls of said second compartment and the assembly consisting of said second container and said thermoelectric unit. A temperature sensitive switch responds to the temperature of said second container, whenever said temperature exceeds a predetermined threshold, to connect said battery source across said thermo-electric unit to initate cooling of said second container for maintaining the insulin refrigerated.

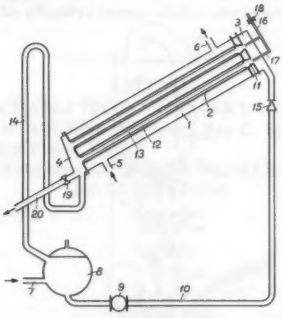
This invention relates generally to portable refrigerators and, more particularly, to very small, self contained, portable refrigerators which have a high thermal efficiency which can be carried on a person's body or in a small case.

3,713,303

MEANS FOR BREAKING DOWN AQUEOUS JELLY-LIKE SOLUTIONS AND THUS SEPARATING WATER AND SOLID CONSTITUENTS FROM EACH OTHER BY MEANS OF FREEZING AND SUBSEQUENT MELTING

Nils Edvin Folke Nilsson, and Jimmie Arne Eurenius, both of Norrkoping, Sweden, assignors to Stal Refrigeration AB, Norrkoping, Sweden

Filed Jan. 18, 1971, Ser. No. 107,346
Claims priority, application Sweden, Jan. 22, 1970, 743/70
Int. Cl. B01d *9/04*
U.S. Cl. 62—123 **3 Claims**



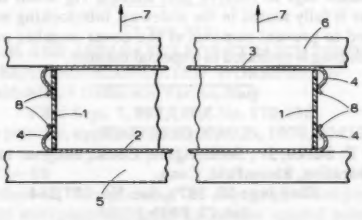
In order to break down aqueous jelly-like solutions and thus separate water and solid constituents from each other, the solution is first frozen and then melted. Means for this comprises two similar heat-exchangers operating alternately as vaporizer and condenser for a cooling plant and the solution is frozen in the vaporizer and melted in the condenser. Each heat-exchanger comprises tubes arranged in a casing between two end chambers. The solution is frozen in the tubes and air is blown through the tubes to remove any unfrozen solution before melting.

3,713,304

MOLD FOR THE PRODUCTION OF DEEPFROZEN BLOCKS OF FOOD

Leif Brudal Knutrud, Underhaugsveien 34, 1342 Jar, Norway

Filed Nov. 23, 1970, Ser. No. 91,755
Claims priority, application Norway, Nov. 24, 1969, 4660/69
Int. Cl. F25c *5/1*
U.S. Cl. 62—341 **3 Claims**



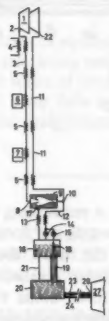
A mold for the production of deepfrozen blocks of food, particularly fish fillet blocks, includes a rectangular shaped frame which is arranged between upper and lower trays. The mold with the goods to be frozen is placed between two freezer plates. The frame has poor heat conductivity between the side of the fillet block and the freezer plates in contact with the trays, and has a small thickness, for instance below 2 millimeters.

3,713,305

DEVICE FOR PRODUCING COLD AT TEMPERATURE LOWER THAN THAT OF λ-POINT OF HELIUM

Frans Adrianus Staas, and Adrianus Petrus Severijns, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1969, Ser. No. 885,542
Int. Cl. F25b *1/06*
U.S. Cl. 62—500 **15 Claims**



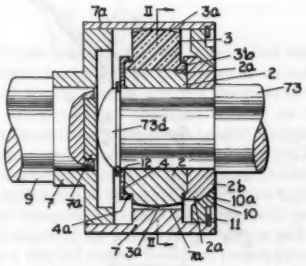
A device for cooling to temperatures lower than that of the λ-point of helium, in which some high-pressure helium, after being cooled, expands to low-pressure and flows back to the compression device, and the remainder of the He is cooled to below its λ-temperature forming superfluid He^4 that flows through a superleak, and normal He^4, and a vortex tube for communicating.

3,713,306

COUPLING

Theo Burdelski; Klaus Gurtner, both of Dusseldorf, Germany, assignors to Ferroplast, Theo Burdelski & Co., Dusseldorf, Germany

Filed Mar. 5, 1971, Ser. No. 121,484
Claims priority, application Germany, Nov. 26, 1970, 20582187
Int. Cl. F16d *3/64*
U.S. Cl. 64—14 **14 Claims**



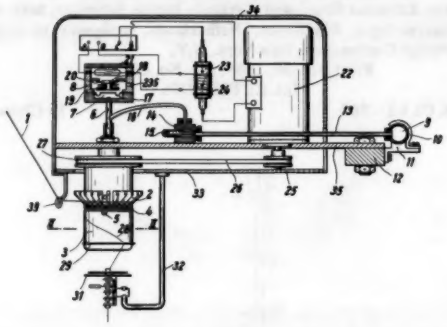
The invention is concerned with a tooth coupling with exchangeable coupling teeth, consisting of inner and outer casings, wherein the inner surface of the outer casing has tooth-shaped recesses and the outer surface of the inside casing has recesses for attaching removable coupling teeth.

3,713,307

THREAD SUPPLY DEVICE FOR TEXTILE MACHINERY

Wolfgang Muhlhausler, Tubingen, Germany, assignor to Fouquet-Werk Frauz & Planck, Rottenburg am Neckar, Germany

Filed Dec. 23, 1971, Ser. No. 211,484
Int. Cl. D04b 15/48; B65h 51/20
U.S. Cl. 66—132 18 Claims



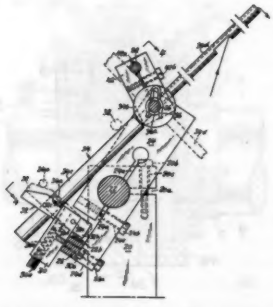
A rotatable drum has a restraining ring slipped thereover. It is held in position towards the bottom end of the drum by magnets located inside the drum, the restraining ring being either of magnetic material or plastic, incorporating magnetic material; the magnetic force holds the ring floatingly. The ring is flexible and, in one embodiment, can just be slipped over a restraining bulge formed on the drum. During operation, the ring slightly deforms into elliptical shape to permit thread to pass therebeneath and over the bulge. Rotation of the drum is controlled pneumatically by intermittently engaging the drum with a continuously rotating drive, for example from the main drive of the machine (which may be a circular knitting machine) or, over clutches, with individual motors in the drums.

3,713,308

STOP MOTION APPARATUS FOR KNITTING MACHINES

Nathan Levin, 416 Highgate Drive, Trenton, N.J.

Filed Aug. 9, 1971, Ser. No. 170,020
Int. Cl. D04b 35/12
U.S. Cl. 66—163 10 Claims



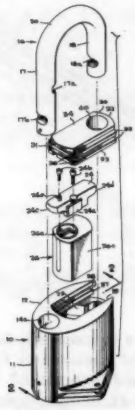
Stop motion apparatus for use with knitting machines and having a fixed rigid shaft, a plurality of spaced brackets secured to shaft, a rotatable shaft journalled in the brackets and movable to a pair of positions, a rectangular bar secured to the brackets, the two shafts and the bar being in spaced parallel relation and being co-extensive, a plurality of spaced yarn arms rotatably supported on the rotatable shaft and movable to normal and to down positions, a like plurality of pivotally movable latches supported on the bar in individual operative relation to the yarn arms to maintain the latter in their normal positions, a plurality of spaced rocker arms secured to the rotatable shaft and movable therewith, a re-setting shaft secured in the rocker arms and movable therewith to a first and to a second position when the movable shaft is moved to its pair of positions, the re-setting shaft in its first position acting as a limit stop for the yarn arms in their down position and the re-setting shaft as it moves to its second position engaging and moving the yarn arms to their normal position, and air operated means secured to the fixed shaft for moving the rotatable shaft.

3,713,309

KEY OPERABLE PADLOCK WITH SLIDABLE SEAL FOR PLUG

Harry C. Miller, Rochester, N.Y., assignor to Sargent & Greenleaf, Inc., Rochester, N.Y.

Filed Nov. 4, 1971, Ser. No. 195,707
Int. Cl. E05b 67/22
U.S. Cl. 70—38 A 10 Claims



A key operable padlock having a padlock body provided with sockets for the legs of a U-shaped shackle, and a central bore located between the sockets shaped to receive and removably house a key lock plug. The bottom wall of the padlock body has a key opening which projects into the key lock plug to operate the plug, and the upper portion of the padlock body has an elongated slot defining a slideway and the cover member is removably positioned. The sides of the slideway and the cover member have alternating tongue and groove formations which interfit with each other to permit the cover member to slide into covering relation over the central bore and through the region of one of the shackle legs to the adjacent end of the padlock body, and the cover member has a cylindrical opening which registers with the socket for one of the shackle legs to receive that shackle leg when the cover member is fully seated in the slideway. Interlocking means are provided to prevent removal of the cover member unless the key lock plug is operated in a special manner.

3,713,310

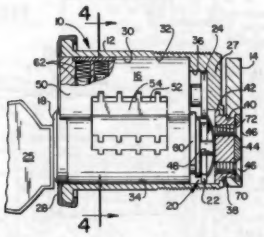
LOCK CYLINDER

Walter E. Surko, Jr., Southington, Conn., assignor to Emhart Corporation, Bloomfield, Conn.

Filed June 28, 1971, Ser. No. 157,264
Int. Cl. F05b 27/00
U.S. Cl. 70—364 A 11 Claims

A lock cylinder having an emergency function and including a housing containing a key-removable core supporting a

rotatable key plug for driving a roll-back supported on the housing externally thereof. An axially movable control member received in the housing rearwardly of the key plug cooperates in one position with a stop lug associated with the housing to limit angular movement of the key plug and the roll-back in one and an opposite direction when an operating



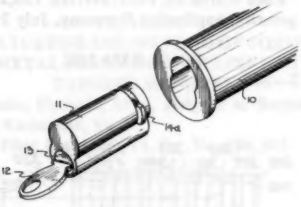
key is employed to operate the lock cylinder. An elongated emergency key is provided which extends through the key plug to engage and shift the control member to another position out of alignment with the stop lug to effect free rotation of the key plug and the roll-back in one and an opposite direction. The effective length of the emergency key is critical.

3,713,311

DETACHABLY FIXED CYLINDER LOCK CORE

Roy N. Oliver, 148 Ellen Drive, and Roy C. Spain, P.O. Box 1668, both of Salem, Va.

Filed May 28, 1971, Ser. No. 147,843
Int. Cl. E05b *35/14*
U.S. Cl. 70—369 **3 Claims**



A cylinder lock core mechanism for insertion into and becoming detachably fixed to a lock housing under control of a special key operating upon a special tumbler in the key plug, the core being retained by a slidable retaining lug emerging through the surface of the core and being retractable by operation of the special key's rotation to cause the tumbler to coact with the retaining lug permitting the core to be withdrawn from the housing — including a deadlock member coacting with the retaining lug under control of the key plug and guiding studs in the core structure whereby the member is cammed to free the retainer for movement only upon rotation of the key plug by the special key.

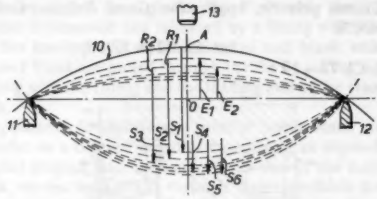
3,713,312

METHODS AND APPARATUS FOR STRAIGHTENING OR BENDING ELONGATED WORKPIECES

Renzo Galdabini, 1 Gallarate, Varese, Italy

Filed Sept. 7, 1971, Ser. No. 178,190
Claims priority, application Italy, Nov. 6, 1970, 31427 A/70
Int. Cl. B21d *7/12*
U.S. Cl. 72—10 **6 Claims**

A method of straightening an elongated workpiece, in which the workpiece is supported at two spaced points and straightening forces are applied between these points by an automatically controlled hydraulic ram, governed by a programming system which causes the first stroke of the ram to defect the work beyond the desired final shape by a distance approximately equal to the calculated maximum elastic deformation, the load is then removed and the residual error



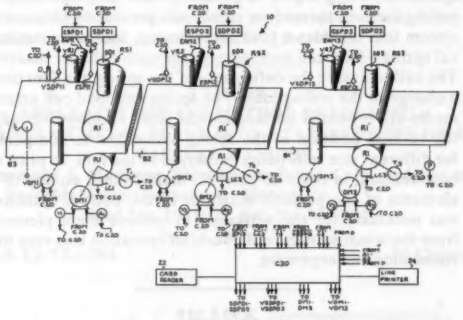
sensed, and a further series of strokes applied at constant increments, the residual error being sensed between strokes and used to initiate a second series of stroke increments of smaller value until the residual error falls below a final preselected value at which acceptable straightness has been achieved.

3,713,313

COMPUTER CONTROLLED ROLLING MILL

Louis W. Spradlin, Scotia, N.Y., assignor to General Electric Co.

Filed Nov. 19, 1971, Ser. No. 200,400
Int. Cl. B21b *37/00*
U.S. Cl. 72—8 **16 Claims**

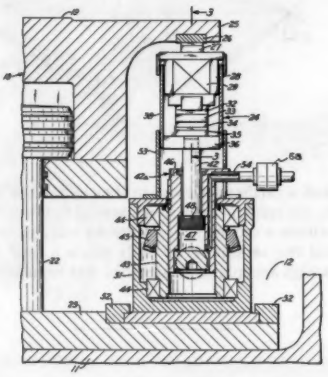


A computer controlled rolling mill is described wherein the force (or power) model in the computer is stored as dual curves, i.e., (a) shaping curves wherein the ratio of the force required for actual rolling conditions relative to the force required for a chosen draft is plotted against elongation, and (b) magnitude curves wherein the force required for the chosen draft is plotted against inverse output thickness from the mill with each point of the magnitude curves having an associated stored temperature value. The arithmetic produce of the force ratio required for a desired elongation and the force magnitude for a desired output thickness (when corrected for width, hardness and temperature of the metal being rolled) provides the force required for the stand. Because the force ratio is normalized with respect to a chosen percentage draft, accurate adaptive updating of the process representation can be achieved conveniently by altering only the magnitude curves.

3,713,314
RETRACTABLE GAUGE CONTROL ASSEMBLY FOR A ROLLING MILL

James Richard Adair, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Sept. 14, 1971, Ser. No. 180,296
Claims priority, application Great Britain, Oct. 2, 1970, 46969/70
Int. Cl. B21b 37/08
U.S. Cl. 72—19 5 Claims



The disclosure of this invention relates to a rolling mill of the hydraulic roll gap control type. The disclosed control includes a bar spring—load cell assembly that is adjustable to position the spring in various rolling positions by a power jack. This entire assembly is received in the window of the mill and by a piston cylinder assembly is retracted therefrom onto a platform when maintenance is to be performed on the assembly.

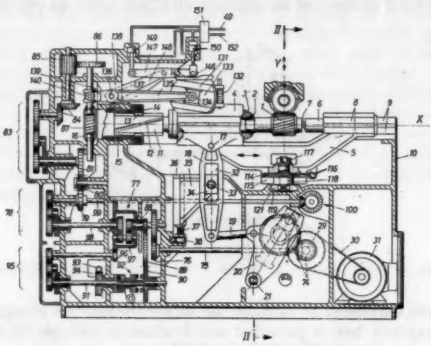
Rolling mills provided with an hydraulic roll gap control system including a pair of piston cylinder assemblies for adjusting the rolls thereof are sometimes provided with a control system that includes a position indicator, such as, a mechanical spring—load cell arrangement for each cylinder assembly. The cells measure the deflections of the spring as a function of a change in the rolling load. The spring and load cell arrangements are mounted on mechanical jacks employed to adjust the vertical position of the spring assemblies to compensate for different size rolls being employed in the mill. In prior mill construction, in order to perform maintenance on any of the elements of the position indicator of the control systems, it was necessary for the workmen to remove them piecemeal from the window of the mill. Such an operation was very time-consuming and expensive.

3,713,315
COLD ROLLING PROFILES ON CYLINDRICAL WORKPIECES

Albert Meyer, Thalwil; Otto Wenger, and Oskar Maag, both of Zurich, all of Switzerland, assignors to Maag Gear Wheel & Machine Company Limited, Zurich, Switzerland

Filed Sept. 8, 1970, Ser. No. 70,377
Int. Cl. B21h 5/02
U.S. Cl. 72—100 14 Claims

In a method for cold rolling profiles on the circumference of a rotating cylindrical workpiece, using tool worms of appropriate profile, the worms performing generating motions corresponding to the profile required in successive part-rolling operations by being moved relative to the workpiece in a closed-circuit locus path having one axis which is in the direction of and smaller than the tooth depth, and which substantially smaller than another axis of said locus which is in the direction of tooth length or thickness, with each part-rolling operation being performed over the entire tooth facewidth while the tools are retained, over the workpiece width, in their dead center position which is a position on said locus innermost relative to the axis of the workpiece, the profile being preformed by progressive radial feed of the operating stroke

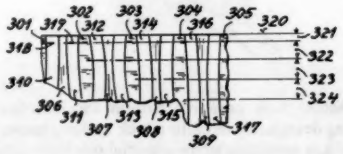


of the tools and with a number of enveloping planes, and the profile being subsequently, finish-formed with a larger number of enveloping planes and with an unchanged inner dead center position of the tool worms.

3,713,316
TOOTHED TOOL FOR AN APPARATUS FOR THE CHIPLESS GENERATION OF GEARS

Gerd Lichtenauer, Unterofaffenhofen, Germany, assignor to Carl Hurth Maschinenund Zahnradfabrik, Munich, Germany

Filed March 26, 1971, Ser. No. 128,270
Claims priority, application Germany, July 29, 1970, P 20 37 638.9
Int. Cl. B21h 5/02
U.S. Cl. 72—102 6 Claims

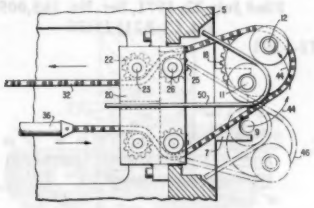


Tool for the chipless generation of gear teeth by rolling. The flanks of each tool tooth are provided with alternate high and low zones which blend in the axial direction of the tool smoothly into each other and provide ridges and hollows extending from the addendum to the deddendum on each flank of each tool tooth. The crowns of said ridges on flanks facing each other across a single tool space may be positioned oppositely to each other and circumferentially following successive pairs of crowns may be progressively offset axially to effect working across the full axial length of the workpiece tooth. Alternatively, said crowns may be opposite each other on each individual tooth of the tool and successively and axially offset with respect to each other on each successive tooth. The smooth blending of ridges and hollows on the tool teeth provide for the generation of a more smooth workpiece tooth and eliminate the line markings on the workpiece teeth which sometimes resulted from the previously known practice of providing abrupt lines or planes of demarcation between pressure ridges and recesses on successive tool teeth.

3,713,317
BENDING MACHINE

Robert L. Schenck, York; George E. Schenck, Dallastown, and Frank W. Senft, York, all of Pa., assignors to Schenck Corporation, York, Pa.

Filed Aug. 25, 1971, Ser. No. 174,641
Int. Cl. B21d 7/024
U.S. Cl. 72—217 7 Claims

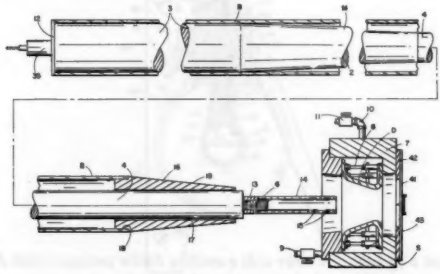


A bending machine having a mandrel carrier, two axles passing through the carrier on a diameter thereof and mandrels mounted on the axles, there being a space between the closest points of the mandrels for the workpiece to pass through. Journals in a fixed frame are provided for the axles so that the carrier can be rotated about the axis of either axle. The carrier is provided with sprocket teeth about its periphery, and is rotated by a chain passing around the sprocket to form a shape generally like a U. The ends of the chain are attached to drive rods which are hydraulically moved to pull the chain and rotate the carrier in either direction. The journals are arcuate and open away from the drive rods, the action of the rods and chain being in a direction to keep one axle in continuous bearing contact with its associated journal. Guide sprockets assist in this task.

3,713,318
APPARATUS FOR AND METHOD OF FORMING A TUBULAR METAL BLANK INTO A TAPERED TUBE ON A TAPERED MANDREL

Frank J. Lesko, Phoenix, Ariz., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jan. 14, 1971, Ser. No. 106,345
Int. Cl. B21c 1/24
U.S. Cl. 72—283 11 Claims



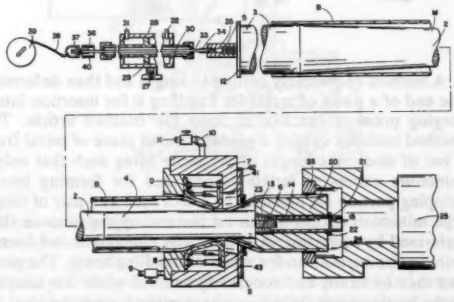
A method of forming a tubular metal blank into a tapered tube on a tapered mandrel comprising disposing the tubular metal blank about the tapered mandrel, applying a bullet-shaped nose to an end of the mandrel and blank, pushing the tapered mandrel with the tubular metal blank thereabout with the bullet-shaped nose leading through an expandable die and by the bullet-shaped nose expanding the die to receive the leading end of the tubular metal blank and thereafter progressively collapsing the tubular metal blank about the tapered mandrel by continuing movement of the tapered mandrel with the tubular metal blank thereabout through the expandable die while exerting inward pressure on the tubular metal blank by the die to form a tapered tube on the tapered mandrel. Preferably the leading end of the tubular metal blank is interfitted with the bullet-shaped nose so that the bullet-shaped nose guides both the mandrel and blank through the die. After the bullet-shaped nose has passed through the die the mandrel and blank are pulled through the die. Preferably the bullet-shaped nose is removed and replaced by a fitting which is applied to the leading end of the mandrel and blank and the mandrel and blank are pulled through the die by pulling means cooperating with the fitting and the leading end of the mandrel and blank.

Also apparatus for forming a tubular metal blank into a tapered tube on a tapered mandrel comprising an expandable die, a bullet-shaped nose appliable to an end of the mandrel and blank, means for pushing through the expandable die the tapered mandrel with the tubular metal blank disposed thereabout and with the bullet-shaped nose applied to the leading end of the mandrel and blank so that the bullet-shaped nose expands the die to receive the mandrel and blank and means for continuing the movement of the mandrel and blank through the die and exerting inward pressure on the blank by the die to collapse the blank about the mandrel. The end of the mandrel desirably has a reduced extension and the bullet-shaped nose may be applied over the reduced extension of the mandrel and may interfit with the end of the tubular metal blank. The means for continuing the movement of the mandrel and blank through the die are preferably pulling means pulling the mandrel and blank through the die by the leading end thereof. The bullet-shaped nose is preferably removable and a fitting is desirably provided which replaces the bullet-shaped nose after the bullet-shaped nose has passed through the die together with means cooperating with the fitting pulling the mandrel and blank through the die. The fitting may be applied over the end portion of the mandrel and snugly received in the leading end of the blank, and means including clamping jaws are preferably provided clamping the leading end of the blank against the fitting and pulling the mandrel and blank through the die. The mandrel may have a further reduced longitudinal projection projecting beyond the reduced extension and the fitting may be applied to such projection and locked against withdrawal therefrom.

3,713,319
APPARATUS FOR AND METHOD OF FORMING A TUBULAR METAL BLANK INTO A TAPERED TUBE ON A TAPERED MANDREL

Raymond A. Matthews, Palos Verdes Estats, Calif., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jan. 19, 1971, Ser. No. 107,684
Int. Cl. B21c 1/26
U.S. Cl. 72—284 10 Claims



Apparatus for forming a tubular metal blank into a tapered tube on a tapered mandrel comprising a die, means for pushing the tapered mandrel with the tubular metal blank thereabout in the forward direction through the die until the leading end of the mandrel and blank protrudes beyond the

die whereafter the mandrel and blank are pulled in the forward direction through the die to complete the formation of the tapered tube on the tapered mandrel and means separate from said pushing means for withdrawing the mandrel in the reverse direction through the die. The withdrawing means preferably comprise flexible tension means, such as a flexible cable, together with a reel on which the flexible tension means are wound and means for turning the reel. The pushing means may comprise piston and cylinder means having a stroke only a fraction of the length of the madrel. The piston desirably has a longitudinal passage therethrough with the withdrawing means extending through the passage. The withdrawing means may comprise means stopping the movement of the mandrel in the forward direction when formation of the tapered tube on the tapered mandrel is completed whereupon the forward inertia of the tapered tube loosens it from the tapered mandrel. The withdrawing means may have stop means thereon which stop means engage the cylinder and thereby stop the forward movement of the mandrel.

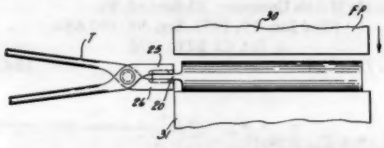
Also a method of forming a tubular metal blank into a tapered tube on a tapered mandrel comprising pushing the tapered mandrel with the tubular metal blank thereabout in the forward direction through a die until the leading end of the mandrel and blank protrudes beyond the die whereafter the mandrel and blank are pulled in the forward direction through the die to complete the formation of the tapered tube on the tapered mandrel, attaching flexible withdrawing means to the trailing end of the mandrel and by the flexible withdrawing means withdrawing the mandrel in the reverse direction through the die. The flexible withdrawing means are preferably attached to the trailing end of the mandrel before the mandrel and blank are pulled in the forward direction through the die. The withdrawing means desirably stop the movement of the mandrel in the forward direction when formation of the tapered tube on the tapered mandrel is complete whereupon the forward inertia of the tapered tube loosens it from the tapered mandrel.

3,713,320

METHOD OF HANDLING METAL STOCK FOR HOT FORGING

Arne O. Andresen, Racine, Wis., assignor to Walker Forge, Inc., Racine, Wis.

Filed May 28, 1971, Ser. No. 148,092
Int. Cl. B21j 5/00
U.S. Cl. 72—361 **4 Claims**



A method of precisely cutting to length and then deforming the end of a piece of metal for handling it for insertion into a forging press or the like to form the finished article. The method includes cutting a predetermined piece of metal from a bar of stock, the length of the piece being such that only a minimum excess of length is provided for forming into a gripping portion for handling by a tool such as a pair of tongs. The minimum excess length on the end of the piece is then deformed by squeezing so as to axially elongate it and form it into a gripping portion for a pair of handling tongs. The piece can then be firmly and accurately handled while it is inserted in the forging press, drop hammer or other forging device.

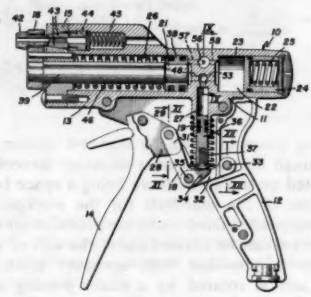
A machine for receiving, holding and deforming a piece of metal which has been heated to a plastic condition, the machine having stop means for holding it against axial shifting in one direction while squeezing jaws of the machine deform the end of the piece into a holding portion. The swingable jaws of the machine are of a shape (1) that precludes axial shifting of the piece in the other direction and (2) that forms the holding portion into a flattened and axially elongated shape having tool engaging projections.

3,713,321

RIVET GUN

Gabriel M. LaPointe, Worcester, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.

Filed July 22, 1971, Ser. No. 165,009
Int. Cl. B21j 15/20
U.S. Cl. 72—391 **13 Claims**



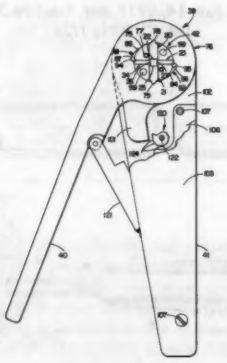
A rivet gun for use with blind rivets making use of a closed-circuit hydraulic system.

3,713,322

CRIMPING TOOL

Milton G. Fischer, Banning, Calif., assignor to The Deutsch Company Electronic Components Division

Filed Jan. 6, 1971, Ser. No. 104,210
Int. Cl. B21d 9/08
U.S. Cl. 72—410 **26 Claims**

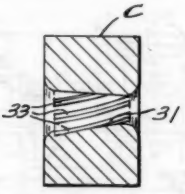


A crimping arrangement for attaching a contact to the end of a wire in which opposed first flat dies are moved inwardly to a position of spaced adjacency in which they compress the contact between them, after which opposed second dies with arcuate concave surfaces and of thicknesses equal to the spacing between the flat dies are moved inwardly to further compress the contact. The dies may be movable in straight slots in a carrier member and actuated by a rotatable cam ring having grooves receiving outer peripheries of the dies to cause the appropriate sequential movement. Handles attached to the cam ring and die carrier member permit hand operation of the tool.

3,713,323
DIE FOR COLD DRAWING

Isin Ivanier, 5509 Westbourne, Montreal, Quebec, Canada

Division of Ser. No. 808,594, March 19, 1969. This application Oct. 21, 1970, Ser. No. 82,748
Claims priority, application Canada, March 18, 1969, 46,097; Great Britain, Oct. 30, 1969, 51,544/69
Int. Cl. B21c 3/00, 1/00
U.S. Cl. 72—467 6 Claims

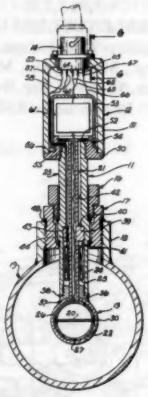


A die and method for cold drawing of metal wire, the die having a substantially circular passage extending throughout its length and tapering from an inlet to an outlet, there being at least three spaced apart grooves extending spirally about the passage and intervened by an arcuate surface of the passage. The grooves are of substantially the same cross section at the inlet and outlet ends of the die.

3,713,324
DENSITOMETER

Charles Eveleigh Miller, Boulder, Colo., and Gerald Lance Schlatter, Boulder, Colo., assignors to International Telephone and Telegraph Corp., New York, N.Y.

Division of Ser. No. 65,371, Aug. 20, 1970, Pat. No. 3,677,067. This application Oct. 20, 1971, Ser. No. 190,787
Int. Cl. G01n 9/00
U.S. Cl. 73—1 R 1 Claim

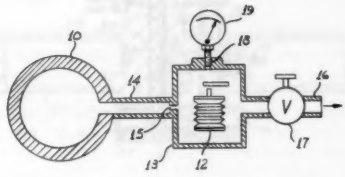


A densitometer which utilizes a thin vane vibrated by a magnetostrictive tube. A piezoelectric crystal pickup feeds an amplifier and tracking filter to energize a coil around the magnetostrictive tube. The device is, in effect, an electromagnetic oscillator in that the coil is driven in phase with the detected signal. Vibration thus increases in amplitude until limited electrically. A linearization circuit provides an output D.C. .voltage directly proportional to fluid density, gas, or liquid, which may be impressed upon a conventional D.C. voltmeter calibrated linearly in density. A great many features, both in the mechanical structure and in the electronics, make it possible to easily calibrate the instrument to read, for example, to within an accuracy tolerance of ± 0.01 percent over a fluid density range of, for example, from about 0.08 pounds per cubic foot to 80.0 pounds per cubic foot. Another outstanding advantage of the invention relates to a probe type construction which may be used in a pipeline of any size.

3,713,325
PRESSURE SENSING DEVICE TESTING MEANS

Joseph M. Brian, 428 Carlyle Avenue, Montreal, Quebec, Canada

Filed Aug. 20, 1971, Ser. No. 173,545
Claims priority, application Canada, June 3, 1971, 114761
Int. Cl. G01l 27/00
U.S. Cl. 73—4 R 3 Claims

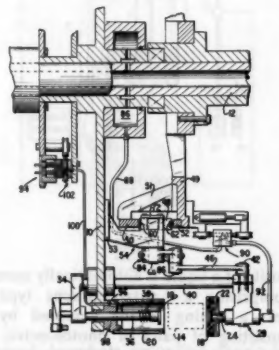


A pressure sensing device has a casing which communicates through a restricted orifice with a pressurized fluid line. A testing gauge is either fixed or removably connected to the casing and a variable flow valve communicates the casing with the atmosphere. The flow rate through the valve is substantially greater than the flow into the casing through the restricted orifice, thus permitting control of the pressure in the casing. Thus the pressure sensing device may be tested without removing it from the fluid line and without materially affecting the fluid pressure in the line.

3,713,326
CAM GEAR POCKET OPENING MECHANISM

Victor I. Roberts, Randolph, and Clifford H. Messervey, East Randolph, both of N.Y., assignors to The Bordon Company, New York, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,127
Int. Cl. G01m 3/04
U.S. Cl. 73—41 10 Claims

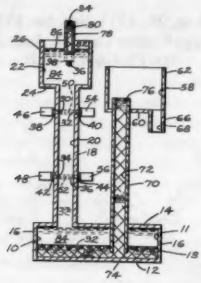


A can testing apparatus includes a spider rotatable through a can receiving station, can testing station and can discharge station; a plurality of test chambers mounted about the periphery of the spider; means for moving cans into and out of the test chambers; and means for actuating the moving means; the improvement residing in the actuating means which includes a cam track, a gear adapted to travel on the surface of the cam track and to pivot about its axis in response to variations in the contour of the cam track, and a shaft in mesh with the gear for transmitting motion to the moving means.

3,713,327
SPECIFIC GRAVITY APPARATUS

Anton Hubert Clemens, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed March 11, 1971, Ser. No. 123,231
Int. Cl. G01n 9/00
U.S. Cl. 73—32 2 Claims

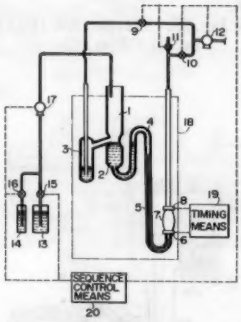


Apparatus useful in the determination of specific gravity of a test liquid by the falling-drop method is described. The apparatus provides an overflow feature wherein the test liquid which is dropped down a fluid column for specific gravity determination subsequently flows up a second column to a drain. This feature enables the initial fluid column to be conveniently repetitively used for specific gravity determinations.

3,713,328
AUTOMATIC MEASUREMENT OF VISCOSITY

Choji Aritomi, Hofushi, Yamaguchiken, Japan, assignor to Idemitsu Kasan Co. Ltd., Tokyo, Japan

Filed Feb. 24, 1971, Ser. No. 118,381
Int. Cl. G01n 11/06
U.S. Cl. 73—55 8 Claims

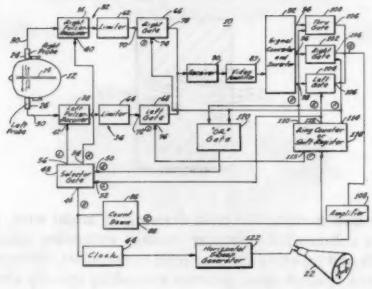


The viscosity of a liquid is automatically measured by an apparatus comprising a Lantz-Zeitfuchs type reverse flow viscosimeter; a timing means actuated by photoelectric devices consisting of pairs of photoelectric cell and light source; a sequence control system; pumps and electromagnetic switch valves; said pumps and valves being internally communicated with said viscosimeter; said photoelectric cells being electrically connected to said sequence control system; whereby the actuations of said valves and pumps are programmed in sequence for measuring the time for viscosity counting, for washing and for drying the viscosimeter. The viscosimeter is placed in a constant temperature bath and has a timing bulb which is of one piece with protection tubes encasing light source lamps and photoelectric cells in pairs at the upper and lower timing marks of said bulb.

3,713,329
ULTRASONIC ECHO ENCEPHALOGRAPH FOR MEASURING THE POSITION OF THE MIDLINE

Donald W. Munger, New Milford, Conn., assignor to Automation Industries, Inc., El Segundo, Calif.

Continuation-in-part of Ser. No. 440,231, March 16, 1965, abandoned. This application Jan. 4, 1966, Ser. No. 518,575
Int. Cl. G01n 29/04
U.S. Cl. 73—67.9 1 Claim

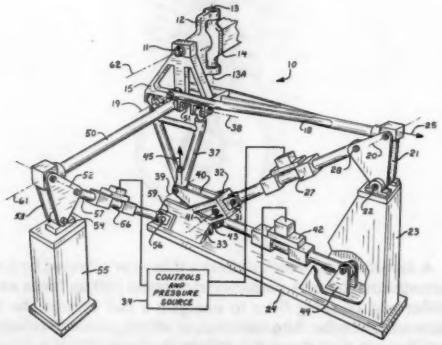


An ultrasonic instrument is disclosed herein which is particularly adapted for locating the midline structure of a brain relative to the geometric center line of a head. The instrument includes means for automatically producing a first indication representing the geometric center line of the head and a pair of indications representing the distances between the midline structure and the two opposite sides of the head. These three indications are all juxtaposed whereby they may be directly compared with each other to positively identify the position of the midline structure and its location relative to the geometric centerline of the head.

3,713,330
AXLE TEST DEVICE

Thomas Phillip Lentz, Chanhassen, Minn., assignor to MTS Systems Corp., Minneapolis, Minn.

Filed Jan. 11, 1971, Ser. No. 105,401
Int. Cl. G01n 3/08
U.S. Cl. 73—93 6 Claims



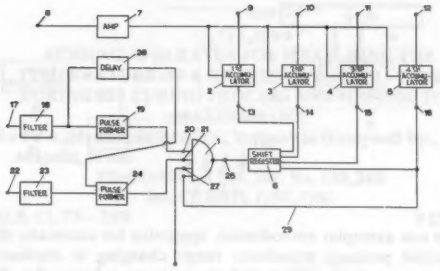
An axle test device which will permit three input forces into the test specimen and which is primarily designed to be the front spindle or rear axle of an automobile or other vehicle, so that simulated testing can be carried out. The test device utilizes bell crank actuators which are designed to give a compact test stand without sacrificing performance and which are designed to compensate for cross coupling effects of movements in different planes.

3,713,331

APPARATUS FOR THE DETERMINATION OF INTERNAL COMBUSTION ENGINE COMPRESSION PRESSURE

Hans-Gunther Petersen, Wolfsburg, and Heiko Requardt, Gifhorn, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Feb. 19, 1971, Ser. No. 116,957
Int. Cl. G01m 15/00
U.S. Cl. 73—117.2 10 Claims



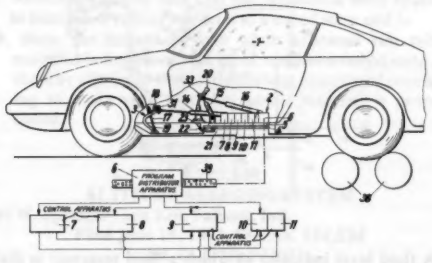
The compression pressure of each of the cylinders in an internal combustion engine is represented by a voltage obtained at a tap on the ground cable of the engine and stored in a respective accumulator by control outputs from a shift register which successively activates each of the accumulators to receive the data associated with the starting current of each cylinder. The input to the shift register is fed from the output of a NAND gate having inputs representing the impulses from all the cylinders, the impulses from a cylinder selected as a synchronizing or coordinating cylinder, a main control signal, and a signal from the output of the last accumulator.

3,713,332

APPARATUS FOR THE AUTOMATIC OPERATION OF OPERATING DEVICES FOR MOTOR VEHICLES

Bernd Herrbrich, 7000 Stuttgart-Stammheim, Germany, assignor to Firma Dr. Ing. h. c. F. Porsche KG, Stuttgart-Zuffenhause, Germany

Filed Feb. 4, 1971, Ser. No. 112,672
Claims priority, application Germany, Feb. 4, 1970, P 20 04 979.0
Int. Cl. G01l 5/13
U.S. Cl. 73—117 8 Claims



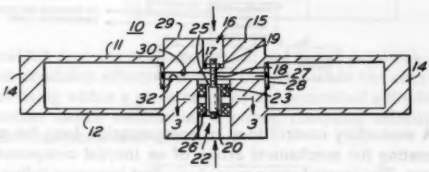
An apparatus for the automatic operation of operating devices of vehicles, especially motor vehicles, in dependence on a program distributor apparatus for simulating plotted driving programs through the use of a roller test stand, wherein the individual operating devices of the vehicle such as the gas pedal, brake pedal, clutch and gear-shifting lever are connectable with servo-motors having control mechanisms operable by means of the program-distributor apparatus. A common base frame arranged opposite to the operating devices in the passenger compartment of the vehicle and to which the program distributor apparatus, the control mechanisms and the servo-motors are fastened. The servo-motors are connected to the operating devices by quick-connectors.

3,713,333

FORCE MEASURING APPARATUS

William D. MacGeorge, Doylestown, Pa., assignor to Testing Technology Corporation, Langhorne, Pa.

Filed June 24, 1971, Ser. No. 156,423
Int. Cl. G01l 1/04
U.S. Cl. 73—141 A 6 Claims



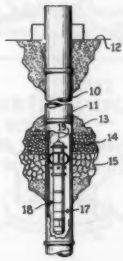
Force measuring apparatus is described which includes a load spring of unitary construction with a multiple arm spring frame assembly, one arm having a centrally located block which carries a fixedly secured outer winding and the other arm a moveable core within the outer winding, the core being capable of controlled limited axial movement in response to tension or compression forces, such movement thereby providing a signal.

3,713,334

DOWNHOLE RECORDER DEVICE FOR LOGGING BOREHOLES

Roy R. Vann, and Clyde R. Vann, both of 3302 Providence Drive, Midland, Tex.

Filed Jan. 25, 1971, Ser. No. 109,383
Int. Cl. E21b 47/00
U.S. Cl. 73—152 9 Claims

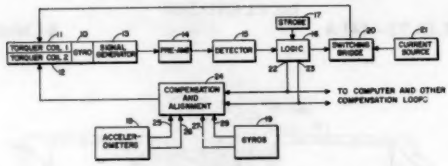


A self contained downhole recording device for use in a method of logging boreholes, which includes logging apparatus electrically connected to a recording means, and further including a power supply and a switch means. The entire apparatus can be lowered into a borehole on a slick line, the switch actuated by manipulation of the slick line, and the structure forming the borehole analyzed by recording magnetic impulses upon the recording device. The apparatus is returned to the surface of the earth and the recording means fed into a strip type recorder device which prints out the magnetic impulses as indicia to thereby form a well log.

3,713,335
CONTROL APPARATUS

Thomas E. Dupuis, Jr., Dallas, Tex., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed April 1, 1969, Ser. No. 811,896
Int. Cl. G01c 21/18
U.S. Cl. 73—178 R 4 Claims

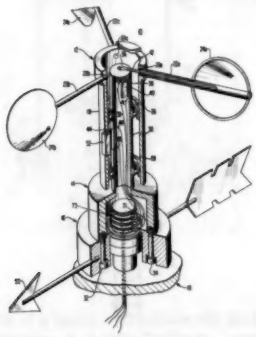


A secondary control loop or compensation loop for compensating for mechanical errors of an inertial component is shown. The inertial component has a first torquer winding and a second torquer winding with the first torquer winding being used in a rebalance loop in the usual manner. The second torquer winding is driven by pulse circuits in response to logic signals derived from the various inertial components on the same platform. The pulses used to drive the second torquer winding are weighted to compensate for mechanical inaccuracies and errors in the inertial component attached thereto.

3,713,336
COMBINATION FLUID FLOW SPEED AND DIRECTION TRANSDUCER

Theodore Bernstein, 5105 Regent Street, Madison, Wis., and Joseph G. Miller, 2113 Tauhee Dr., Madison, Wis.

Filed Nov. 27, 1970, Ser. No. 93,371
Int. Cl. G01w 1/02
U.S. Cl. 73—189 6 Claims

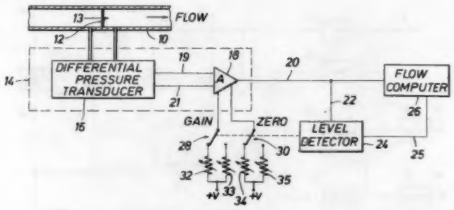


A transducer including an anemometer having a magnetic flux concentrator in one arm thereof and including an earth's magnetic field sensitive device for providing a first electric signal which is a measure of both wind direction and the direction of the earth's magnetic field. A permanent magnet fixed to the rotating anemometer energizes once each revolution thereof a reed switch positioned by a wind vane, thereby producing another electric signal which corresponds to the wind direction. Both signals are applied to an indicator which provides a simultaneous indication of wind speed and wind direction relative to the earth's magnetic north pole.

3,713,337
APPARATUS AND METHOD FOR AUTOMATIC DIFFERENTIAL PRESSURE TRANSDUCER RANGE CHANGING

Larry J. Stroman, Houston, Tex., assignor to Daniel Industries, Inc., Houston, Tex.

Filed Feb. 4, 1971, Ser. No. 112,670
Int. Cl. G01f 7/00
U.S. Cl. 73—205 R 7 Claims

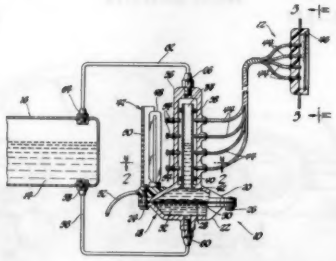


In one exemplar embodiment, apparatus for automatic differential pressure transducer range changing is disclosed, utilizing a single differential pressure transducer the differential pressure measurement range of which may be changed merely by changing the characteristics of the electrical circuit generating a signal representative of the measured differential pressure and a signal level detector circuit to receive the output signal from the transducer and generate a signal the polarity of which changes in response to a change in level of the transducer output signal beyond a predetermined limit representative of a change in measurement range of the transducer. The Polarity-changing output signal of the detector circuit actuates a switching circuit to switch appropriate predetermined resistive elements into the transducer amplifier gain circuit to incrementally change the amplifier gain, and hence, the measurement range of the transducer.

3,713,338
FIBER OPTIC LIQUID LEVEL INDICATOR

Ronald W. Kind, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 18, 1971, Ser. No. 107,080
Int. Cl. G01f 23/02, 23/14
U.S. Cl. 73—293 1 Claim



A fluid level indicator in which a fluid reservoir is divided into two fluid chambers by a flexible diaphragm. The first chamber is filled with a light absorbing fluid and the second chamber is connected to a container containing a fluid whose level is to be indicated so that the fluid is supplied to the second chamber at a pressure which corresponds to the level of the fluid in the container. An upright transparent vessel is mounted over an opening in the first chamber through which fluid may pass into the vessel. The pressure of the fluid in the second chamber due to the level of the fluid in the container exerts a force on the diaphragm to force the light absorbing fluid in the first chamber through the opening into the upright

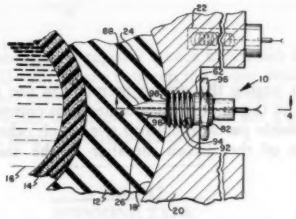
transparent vessel to a level at which the fluid pressures acting on each side of the diaphragm are equal. The ends of a series of fiber optic members are vertically aligned adjacent to the transparent vessel and the remaining ends are terminated at a remote viewing station. The fiber optic members are illuminated by a light source positioned opposite the ends of the fiber optic members and external to the transparent vessel. The fiber optic members in the region above the light absorbing fluid in the vessel are illuminated to provide an indication at the remote station of the level of the fluid in the container.

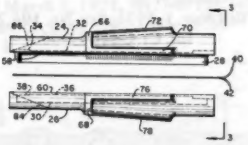
3,713,339

SENSING APPARATUS FOR MEASURING THE TEMPERATURE OF A HEATED RUBBER MATERIAL DURING ITS CURING PROCESS AND METHOD FOR MAKING SAME

Lewis A. Medlar, Orland, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 12, 1971, Ser. No. 188,268
Int. Cl. G01k *1/08, 7/00*
U.S. Cl. 73—359 **9 Claims**





A uniquely constructed sensing apparatus is provided to

1. continuously and more accurately sense the temperature of a heated rubber material in a mold than has heretofore been possible,
2. reduce the curing time that has heretofore been required to heat a raw rubber material to a cured state and to
3. sense the instant of time when a heated raw rubber material being cured in a mold reaches a cured state and thereby eliminate the costly present practice of overheating to make sure that the rubber material is properly cured.

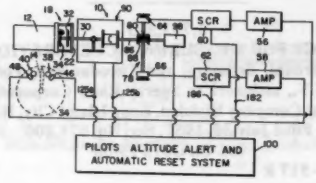
3,713,340

ALTITUDE ALERTING SYSTEM

Earl W. Springer, Box 220, Failand, Ind.

Filed June 18, 1971, Ser. No. 154,534
Int. Cl. G01c *21/00*
U.S. Cl. 73—384 **30 Claims**

An altimeter system including a barometric sensing device, an output device including an encoder and a synchro transmitter effective to provide an electrical output corresponding to the altitude sensed by the sensing device, and a control device including a first device for registering a prescribed altitude and a second device for registering the altitude represented by the electrical output of the output device. Each of the first and second register devices includes a mechanical counter and a positioning mechanism, such as a lead screw, drivingly connected to the counter. The first register device is manually adjustable while the second register device is driven by a synchro receiver dominated by the said synchro transmitter of the output device. The positioning mechanism moves or positions portions of switches which



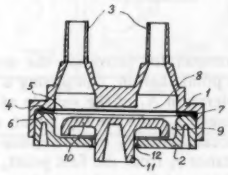
establish desired circuit conditions, one switch providing a circuit condition effective to alert the pilot when the aircraft is not flying within a given range of the prescribed altitude and another switch establishing a circuit condition effective to reset the system after testing.

3,713,341

PRESSURE TRANSDUCER

Rud Frik Madsen, and Jens Herman Jensen, both of Nakskov, Denmark, assignors to Aktiesefskabet De Danske Sukkerfabrikker, Copenhagen, Denmark

Filed May 3, 1971, Ser. No. 139,706
Claims priority, application Denmark, May 4, 1970, 2249/70
Int. Cl. G01l *7/08*
U.S. Cl. 73—406 **1 Claim**



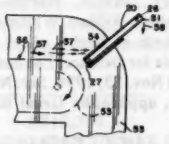
In a blood pressure transducer a pressure compartment is sealingly closed by a plane diaphragm sensing the pressure of a liquid flowing through said compartment via inlet and outlet means. The pressure sensed is transmitted to a measuring device via a pressure transfer element.

3,713,342

GRAIN SAMPLER

Frank J. Jirik, Fisher, Minn.

Filed March 24, 1971, Ser. No. 127,466
Int. Cl. G01n *1/20*
U.S. Cl. 73—422 **1 Claim**



The invention comprises a grain sampler having a rectangular elongated frame for slidable insertion into a grain passageway in a direction laterally across the travel of grain through the passageway. The outer end of the frame of the sampler projects out of the passageway when inserted. A

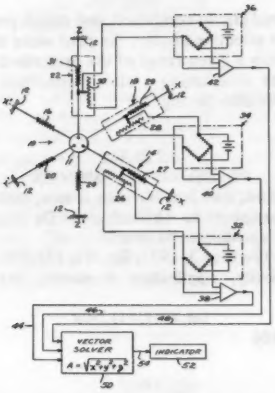
channel member is provided on the frame having an opening for receiving a sample of grain as it travels through the passageway. A pair of endless chains carries the channel member along the frame and out of the passageway and empties the sample of grain out of the channel member.

3,713,343

DEVICE FOR MEASURING ACCELERATIONS

Roy R. Segerdahl, Bellmore, and Theodor Erb, Forest Hills, both of N.Y., assignors to Sperry Rand Corporation, Ford Instrument Company Division, Long Island City, N.Y.

Filed July 30, 1957, Ser. No. 675,800
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 R **9 Claims**



1. An accelerometer for providing the acceleration of a vehicle at a first point therein, comprising a first means for yielding the acceleration $\overline{A}_1$ of the vehicle at a second point disposed at a distance r_1 from the first point, a second means for yielding the acceleration $\overline{A}_2$ of the vehicle at a third point disposed at a distance r_2 from the first point, and computing means connected to said first and second means for yielding the acceleration $\overline{A}$ of the vehicle at the first point in accordance with the formula

$$\overline{A}=\overline{A}_1-\left(\frac{1}{1-r_2/r_1}\right)(\overline{A}_1-\overline{A}_2)\,x$$

$\overline{A}_1$ being equal to $\overline{A}+\overline{e}_1$, $\overline{A}_2$ being equal to $\overline{A}+\overline{e}_2$ and $\overline{e}_2$ being equal to $\overline{e}_1(r_2/r_1)$ where $\overline{e}_1$ is the acceleration of the second point about the first point and $\overline{e}_2$ is the acceleration of the third point about the first point.

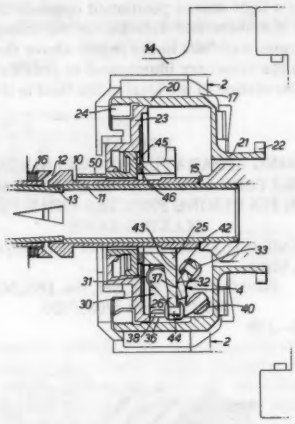
3,713,344

CENTRIFUGAL GOVERNOR

Christopher Linley Johnson, Hartshorne, near Burton-on-Trent; John Robert William Whitmarsh, and Kenneth Arnold Basford, both of Derby, all of England, assignors to Secretary of State for Defence, London, England

Filed Nov. 13, 1970, Ser. No. 89,395
Claims priority, application Great Britain, Nov. 17, 1969, 56,192/69
Int. Cl. G05d *13/14*
U.S. Cl. 73—546 **4 Claims**

The invention concerns a centrifugal governor comprising a rotatable driving member, a plurality of equi-angularly spaced apart flyweights which have driving connections with the said driving member so as to be rotated by the latter, at least portions of the flyweights being movable radially outwardly under centrifugal force, a rotatable and axially movable driven member having driving connections with the flyweights so as to be rotated thereby and so as to be moved axially thereby in a given axial direction when the flyweights move radially outwardly, the driving and driven members being coaxial, and



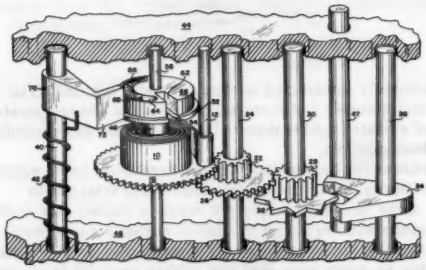
means for urging the driven member in the opposite axial direction, all the said driving connections comprising relatively non-slidable parts which roll over each other during axial movement of the driven member in the said given axial direction.

3,713,345

MECHANICAL TIMER FAIL-SAFE MECHANISM

Timothy B. Sands, Acton, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 1, 1971, Ser. No. 194,214
Int. Cl. G04b *15/00*
U.S. Cl. 74—1.5 **7 Claims**



A fail-safe mechanical timer mechanism is provided having a spring connection between the main spring input and the driving gear such that the relative positions of the drive spring end and the driving gear are maintained as a function of the escape mechanism retarding torque. A lockup feature is provided when the proper relationship between driving torque and escapement energy dissipation rate does not exist.

3,713,346

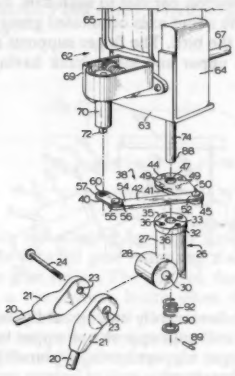
OSCILLATOR MECHANISM FOR FAN

James Chamberlain, Willowdale, Ontario, and John Bradley, Scarborough, Ontario, both of Canada, assignors to Rotor Electric Company Limited, Toronto, Ontario, Canada

Filed Oct. 4, 1971, Ser. No. 186,008
Int. Cl. F16h *21/18*
U.S. Cl. 74—42 **9 Claims**

An oscillating fan is disclosed in which a ratchet arm and a crank arm are joined by a connecting link, with the crank arm

being driven by the fan motor through a reduction gear mechanism. The fan proper is attached to a vertical swivel shaft adapted to rotate in a bore in an oscillator member fixed to a stand. Normally the ratchet arm is fixed with respect to



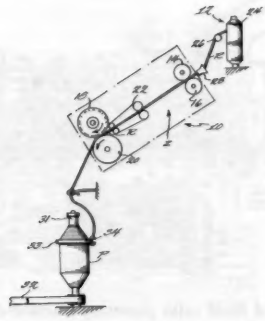
the oscillator member by registry means which can be forced out of registry. Detent means between the swivel shaft and the oscillator member limit the relative rotation of the former with respect to the latter to an arc the same as the arc through which the fan is adapted normally to turn.

3,713,347

SPINNING TAPE

Everett C. Atwell, Greensboro, N.C., and Homer Lee Ballard, South Hill, Va., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed March 5, 1971, Ser. No. 121,360
Int. Cl. F16g *1/00*; C03c *25/00*
U.S. Cl. 74—231 R **9 Claims**



A spinning tape which has a cured resorcinolformaldehyde/latex finish thereon, the tape being characterized by its essential freedom from lint build-up and glazing in use.

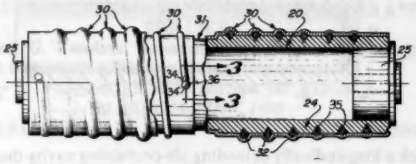
3,713,348

CENTERLINE TRACKING ROLLERS FOR CLOSED LOOP SYSTEMS

Rene Conrad, San Mateo, and John Hohmann, Sunnyvale, both of Calif., assignors to Dynaloc Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 75,913, Sept. 28, 1970, abandoned. This application Sept. 27, 1971, Ser. No. 183,808
Int. Cl. F16h *7/18, 55/36*
U.S. Cl. 74—240 **20 Claims**

Centerline Tracking Rollers in which tubular cylindrical members have oppositely wound spirally tending ribbing on their peripheries on opposite sides of a central depression, the ribbing being applied wire elements either pre-coiled or wound directly onto the cylindrical members or into grooves formed in the peripheries thereof which may be grooved for seating the wire elements and the grooves of diminishing



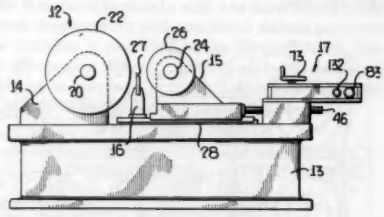
depth from center to the ends of the cylindrical members to provide tapering spirally tending ribbing thereon; the convolutes of such wire elements may be plain or undulated by waveforms for non-slip gripping and centering action relative to belting trained about such rollers.

3,713,349

PRELOADED INCREMENTAL FEED DEVICE

Carl F. Benson, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed July 30, 1970, Ser. No. 59,759
Int. Cl. F16h *55/18*; B23c *9/00*
U.S. Cl. 74—409 **31 Claims**



The device provides very small increments of linear motion, such as are required in adjusting the elements of machine tools for size control. The device utilizes two ball screws secured to a movable machine tool element, with associated ball nuts carried by the screws, the ball nuts being preloaded against each other through a gear train or like driving means. Two or three ball screws may be utilized, with one or more screws loaded in tension, and one or more loaded in compression. The device is thus completely preloaded to eliminate backlash normally attendent to reversal of direction of the linearly movable machine element. The drive means comprise a shaft having a disk mounted thereon, which is manually rotatable, or which may be moved through a predetermined arc by engaging an edge of the disk with a cylinder actuated plunger, the plunger being carried by a pivotally movable drive lever which is provided with movement from a drive cylinder at one end, and which has adjustable stops for limiting the pivotal movement of the drive shaft. The pivotal movement of the drive shaft undergoes a double reduction in the device, resulting in increments of linear movement less than ten millionth of an inch with zero backlash.

3,713,350

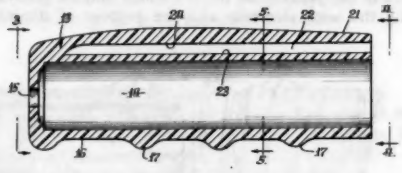
AIR CUSHION HANDLEBAR GRIP

Frank P. Brilando, Niles, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed May 17, 1971, Ser. No. 143,767
Int. Cl. B62k *21/26*
U.S. Cl. 74—551.9 **2 Claims**

Air cushion handlebar grip slidable onto handlebar and having lower portion with finger-receiving scallops, side portions

with peripherally spaced and longitudinally extending grooves, and upper portion opposite finger-receiving scallops



with a longitudinally extending air-containing cavity therein to absorb shocks and prevent pinching of nerves in palmar aspect of hand.

3,713,351

ELECTRICAL AUTOMATIC SHIFT CONTROL SYSTEM WITH HILLY COUNTRY DETECTING UNIT

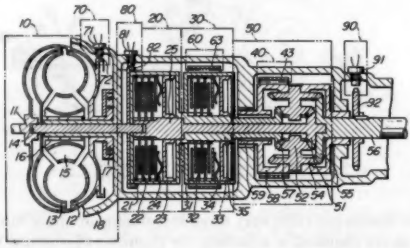
Shigeru Sakakibara, Aichi-ken; Takaaki Kato, Toyohashi-shi, and Katsunori Ito, Kariya-shi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi and Nippondenso Kabushiki Kaisha, Kariya-shi, Japan

Filed Sept. 17, 1970, Ser. No. 73,158

Claims priority, application Japan, Sept. 27, 1969, 44/77247; Oct. 20, 1969, 44/83725; Nov. 14, 1969, 44/91729; Feb. 12, 1970, 45/12381

Int. Cl. F16h *47/50, 5/42;* **B60k** *21/00*

U.S. Cl. 74—645 **12 Claims**



The present invention relates to an electrical automatic shift control system with a hilly country detecting unit which is adapted for use with an automatic transmission for automobiles comprising a fluid type torque converter transmission with a speed change gear, friction engaging means for accomplishing shifting gear engagements of the speed change gear, and a hydraulic actuation circuit for controlling the friction engaging means. The automatic shift control system comprises a climbing road condition logic circuit, a downhill road condition logic circuit and a memory circuit, whereby it functions such that the control unit of the torque converter for effecting normal automatic gear changes in a hilly country is properly restrained from changing to top gear thereby automatically and easily preventing the transmission from changing to top gear on inclines and declines and on curved roads, while this hilly country driving condition is released upon changing into level road running.

3,713,352

POULTRY PICKER

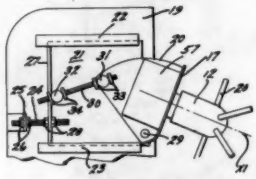
Edward J. Crane, Ottumwa, Iowa, assignor to International Agri-Systems, Inc., Ottumwa, Iowa

Division of Ser. No. 753,251, Aug. 16, 1968, Pat. No. 3,585,675. This application Nov. 30, 1970, Ser. No. 93,696

Int. Cl. F16h *37/06*

U.S. Cl. 74—665 GB **9 Claims**

A poultry picker machine for picking feathers from poultry suspended from overhead and carried through the machine. Positioned on each side of the path of travel of the poultry through the apparatus are a plurality of finger supports supporting a plurality of flexible fingers extending in at least three directions, that is, extending in a direction substantially perpendicular to the axis of rotation, in a direction askew to said axis, and in a direction parallel to such axis. Each of the supports are rotatable about axes orientated generally toward the path of travel of the bird. The finger supports are arranged in three banks, the upper and lower bank having their axes of



rotation inclined downwardly and upwardly, respectively. On one side of the travel path opposite an upper bank is a rotatable drum-type finger support having a plurality of fingers extending radially therefrom.

The banks of finger supports are arranged to be adjustable as one unit. The assembly forming the bank is a single gear box assembly so that all of the finger supports of each bank are driven by one motor which is mounted on the assembly so that when adjusted the motor moves with the assembly.

3,713,353

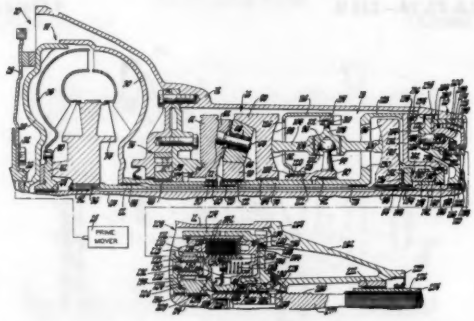
TRANSMISSION

Milton H. Schelter, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1971, Ser. No. 112,246

Int. Cl. F16h *47/00, 47/08, 37/06*

U.S. Cl. 74—730 **9 Claims**

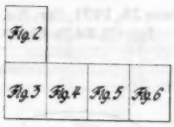


A combined fixed ratio planetary traction-drive and toric roller transmission, including a fluid torque converter wherein, in one embodiment, the power input is split at the impeller, with a portion thereof being directed through the planetary drive to overdrive the input race of the toric roller section, thereby reducing torque into the toric section and, consequently, reducing the size requirements of the toric section. The output from the output race is directed to a stator having no overrunning clutch, to rotate the stator in a direction opposite to that of the impeller and turbine. Such external control of the relative speeds of the stator and impeller provides improved converter torquelspeed ratio characteristics. Reaction for the sun member and the roller support is through a nonrotating axial loader mechanism to the casing. A second embodiment utilizes a conventional torque converter stator and overrunning clutch arrangement downstream of the above-described planetary-toric drive, along with the above-described nonrotating axial loader mechanism and means for reducing torque into the toric section.

3,713,354
TRANSMISSION AND CONTROL

John O. Edmunds, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 8, 1971, Ser. No. 104,867
Int. Cl. F16h 47/00, 57/10, 47/08
U.S. Cl. 74—732 5 Claims

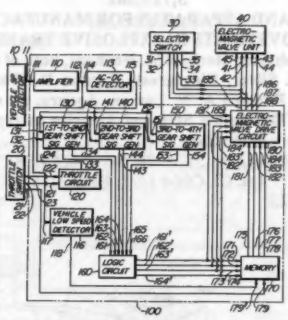


A transmission and control having a fluid or mechanical drive input in the forward gear ratios and a mechanical drive input in reverse gear ratios. The control, for controlling the engagement of a low-reverse brake when the transmission operation is changed for neutral or forward or reverse drive, has a shift valve responsive to a relay valve controlled by a manual valve. The relay valve responds to movement of the manual valve from neutral to forward or reverse drive to actuate the shift valve thereby directing fluid to engage the low-reverse brake. The control may be operated to selectively provide a mechanical input drive in the first ratio also.

3,713,355
AUTOMATIC TRANSMISSION CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS ON VEHICLES

Hisato Wakamatsu, Kariya; Akira Kitano, Nagoya, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Japan

Continuation-in-part of Ser. No. 34,098, May 4, 1970. This application July 24, 1970, Ser. No. 58,080
Claims priority, application Japan, Aug. 6, 1969, 44/62568
Int. Cl. B60k 21/00; F16h 5/42
U.S. Cl. 74—866 5 Claims



An automatic transmission control system for automatic transmissions on vehicles, which comprises a vehicle speed detector to produce an output signal at frequencies proportional to the vehicle speed, an AC-DC converter to produce an analog signal by converting the output signal of the vehicle speed detector, an engine load detector to produce an output signal corresponding to the engine load, a gear shift signal generator circuit to generate a shifting signal by detecting a shifting point from the output signals of the AC-DC converter and the engine load detector, and a memory normally producing an output signal in accordance with the gear shift signal from the gear shift signal generator circuit for shifting the gear position of the transmission gear-shifting mechanism. If the engine throttle valve is closed, the output signal of the memory is locked, irrespective of subsequent changes of the gear shift signal until the vehicle speed is reduced to a predetermined low value. A low speed detector produces an output signal when the vehicle speed is reduced to the predetermined low speed, thereby releasing the locked state of the memory.

3,713,356
SOCKET RELEASE MECHANISM FOR WRENCHES AND THE LIKE

Raymond G. Knudsen, Kenosha, Wis., assignor to Snap-On Tools Corporation, Kenosha, Wis.

Filed Jan. 18, 1971, Ser. No. 107,035
Int. Cl. B25b 13/00, 1/00
U.S. Cl. 81—177.6 1 Claim

The invention concerns itself with an improvement in release mechanisms for wrench sockets which are detachably connected to a turning shank such as but not limited to a ratchet driven shank by a spring impelled detent. The spring impelled detent is readily adapted to frictionally hold and retain wrench sockets to a turning shank, but it usually involves the use of two hands to remove such sockets from turning shanks equipped with spring impelled detents, and to obviate this requirement and to afford the ready release of the sockets from their turning shanks with one hand manipulation, and elongated displaceable and combined detent positioning and release member is provided in the turning shank that is simple and serves as a detent camming element cooperating with the detent to displace it relative to the socket recess responsive to finger longitudinal displacement thereof.

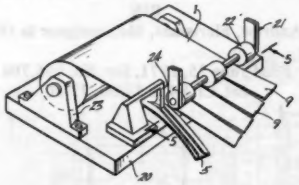
ERRATA

For Classes 83—718 and 83—523 see:
Patents Nos. 3,713,470 and 3,713,471

3,713,357
APPARATUS FOR SLITTING SHEET METAL

Norval A. Keith, 171 Clearview Street, East Alton, Ill.

Division of Ser. No. 5,548, Jan. 26, 1970. This application July 26, 1971, Ser. No. 166,267
Int. Cl. B26d 1/02, 3/00, 9/00
U.S. Cl. 83—1 7 Claims



A process and apparatus for slitting sheet metal having a plurality of inflatable fluid passageways therein into strips, each having at least one inflatable fluid passageway which comprises providing sheet metal having at least two sheets pressure welded together in some areas and having a plurality of unwelded areas corresponding to inflatable passageways. The sheet metal contains at least one unwelded area extending within it in a predetermined fixed relationship to the remaining unwelded area, this one unwelded area being a control tube for use in aligning the sheet metal for slitting. The aligning of the sheet metal is achieved by passing it about a locater

mandrel which plows open the control tube and fixes the position of the sheet as it enters the slitting assembly. The sheet metal as thus aligned then proceeds into a conventional slitting assembly wherein it is cut into strips. The locater mandrel may be fixed or may be provided with means for adjusting its position relative to the slitting assembly. A second slitting assembly may be employed ahead of the locater mandrel whose purpose is to remove a portion of the strip containing part of the control tube.

3,713,358

APPARATUS AND PROCESS FOR SEVERING FLEXIBLE SHEET MATERIALS

James R. Honeycutt; Thomas F. Friday, both of Charlotte, and Terry S. Floyd, Matthews, all of N.C., assignors to Celanese Corporation, New York, N.Y.

Filed June 30, 1971, Ser. No. 158,198
Int. Cl. B20d *11/00*
U.S. Cl. 83—35 **9 Claims**

An improved apparatus and process for continually severing continuous flexible sheet material, particularly smokable sheet materials, into discrete pieces having a parallelogram configuration is described.

ERRATUM

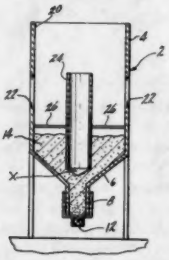
For Class 83—790 see:
Patent No. 3,713,466

3,713,359

SAFETY SYSTEM FOR EXPLOSIVE POWDER STORAGE BIN

Eugene A. Andrew, Florissant, Mo., assignor to Olin Corporation

Filed June 25, 1971, Ser. No. 156,706
Int. Cl. F42b *33/00, 37/00*
U.S. Cl. 86—1 **4 Claims**



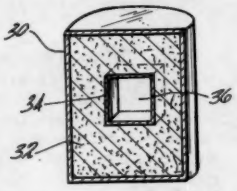
Prevention of deflagration of explosive powder from developing into a detonation within a storage chamber is accomplished by venting pressure from within the storage chamber so that the critical mass detonation rate of burning of the powder can never be reached.

3,713,360

SAFETY CONTAINER FOR EXPLOSIVE POWDER

John W. Shansey, Alton, Madison, Ill., assignor to Olin Corporation

Filed June 25, 1971, Ser. No. 156,697
Int. Cl. F42b *33/00*
U.S. Cl. 86—1 **7 Claims**



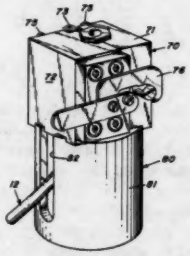
A container for a volume of explosive powder is provided with a volumetric void within the mass of the powder in the area thereof capable of creating a burning rate equal to the mass detonation rate of the powder upon ignition of the powder. The void is formed by a volumetric member positioned within the mass of the powder, the member being arranged so as to prevent powder from sifting into the void. The void provides a volume for accumulation of combustion gases sufficient to prevent the gas pressure within a burning mass of powder from increasing to the point wherein the mass detonation rate of the powder mass is reached. Thus the ignited mass of powder merely burns itself up without detonating.

3,713,361

METHOD AND APPARATUS FOR MANUFACTURE OF AND IMPROVEMENTS IN EXPLOSIVE TRANSFER LINK

Clifford T. Johnson; Herbert M. Neuhaus, both of China Lake; Wallace E. Silver, Ridgecrest; Gordon D. Whiting, China Lake, and Richard A. N. Larson, Agoura, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 31, 1970, Ser. No. 68,582
Int. Cl. C06d *1/08*; F42b *3/10*
U.S. Cl. 86—22 **2 Claims**

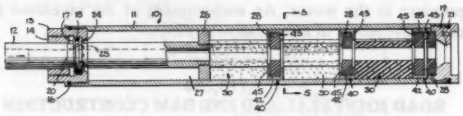


An explosive transfer link is designed to the assembled by a novel method which eliminates hazards inherent in prior production. The high energy booster charges at each end are not placed in position until final assembly. The charges are then press loaded by remote control.

3,713,362
SILENCER

Dwayne W. Charron, Chicopee, Mass., assignor to Bangor Punta Operations, Inc., Greenwich, Conn.

Filed Nov. 16, 1970, Ser. No. 89,934
Int. Cl. F41c 21/18; F41f 17/12
U.S. Cl. 89—14 D 13 Claims

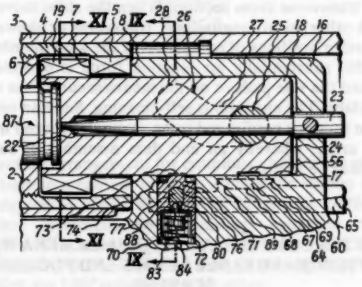


A silencer for firearms comprising a casing enclosing a plurality of sealing members positioned within the casing at spaced intervals, each sealing member being formed of elastomeric material and having an aperture of diameter less than the diameter of a firearms projectile that passes through the silencer; and a plurality of filtering members separating the sealing members within the casing, each filtering member being formed of compacted metal particles of brass, bronze or stainless steel, and each filtering member having an aperture for free passage of a firearms projectile through the silencer. The sealing members momentarily provide an interference fit around a projectile passing therethrough so that the gases may expand both rearwardly and forwardly through filtering members with consequent reduction in velocity of the gases.

3,713,363
AUTOMATIC FIREARM

Ernst Hurlemann, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Dec. 7, 1970, Ser. No. 95,710
Claims priority, application Switzerland, Dec. 19, 1969, 18912/69
Int. Cl. F41d 5/04
U.S. Cl. 89—185 5 Claims

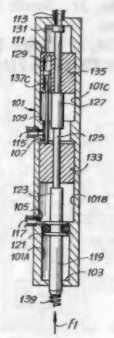


An automatic firearm having a breechblock and breechblock carrier movable in the breech casing. An element for coupling the breechblock carrier and breechblock is displaceable in the breechblock carrier and engages a groove in the breechblock. A first inclined cam rail supports the coupling element when the breechblock carrier moves to the rear. A second flat cam rail supports the coupling element in a coupling position during forward motion of the breechblock carrier. Deflecting faces are provided for transferring the coupling element to and from the two surfaces. This arrangement decreases the forces applied to the cam rails thus decreasing the likelihood of distortion.

3,713,364
FLUID CONTROL DEVICE

Giovanni Francia, Genova, Italy, assignor to L. I. R.-S.p.A.-Laboratorio Italiano, Ricerche, Genova, Italy

Filed May 13, 1970, Ser. No. 36,837
Claims priority, application Italy, May 14, 1969, 4584 A/69
Int. Cl. F15b 11/18; F01b 7/10
U.S. Cl. 92—13.1 10 Claims

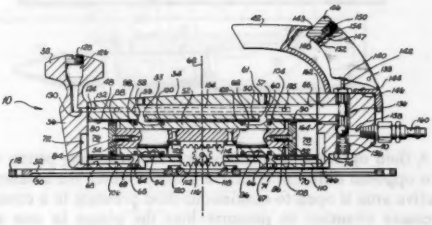


A device for the movement of a mechanical member into a plurality of positions along a rectilinear trajectory. A hollow cylinder has a plurality of outer stops spaced in its own inner walls, and an axial element is axially movable in said cylinder to actuate the mechanical member. The axial element is provided with an enlarged piston sealing the cylinder and a plurality of axial inner stops spaced along its axial stem. Fluid passages in the hollow cylinder are controlled to feed fluid into and discharge fluid from the cylinder. At least one satellite piston is slidable in the cylinder and is movable between two outer stops of the cylinder and between two inner stops on a stem portion of the axial element. The fluid feed and the discharge are effected according to a series of combinations in a binary code and there is obtained consequent movements of the satellite piston and the axial element in cooperation with the stops, to define respective stopping positions of the axial element.

3,713,365
PNEUMATIC RECIPROCATING TOOL

Robert S. Goodrich, Palos Verdes Peninsula, Calif., assignor to Ranger Pneumatic Tool Company, Ranger, Tex.

Filed Dec. 23, 1970, Ser. No. 100,992
Int. Cl. F01l 15/18
U.S. Cl. 91—25 3 Claims



A pneumatic reciprocating tool in which a reciprocating piston is slidingly disposed through a slide valve with its ends extending therebeyond and formed to be slidingly received within a piston bore independently of the slide valve for a predetermined extent of travel. Fluid passageways are formed in the tool body from a fluid intake valve to spaced intermediate locations in the piston bore and are interconnected by the slide valve to passageways leading to the opposite ends of

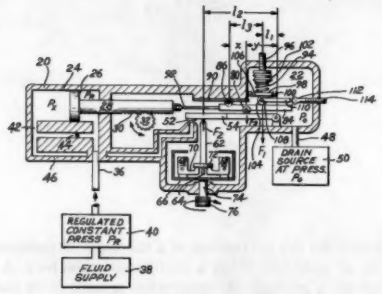
the piston bore. The piston and an underlying tool carriage are formed with opposing rack gears and a gear wheel is disposed in mesh with the rack gears thereby interconnecting the tool carriage and piston for inverse movement of the tool carriage relative to the piston.

3,713,366

FORCE BALANCE LEVER MECHANISM

Howard Lewis McCombs, Jr., South Bend, Ind., assignor to The Bendix Corporation

Filed March 24, 1971, Ser. No. 127,700
Int. Cl. F15b 9/10
U.S. Cl. 91—47 **16 Claims**



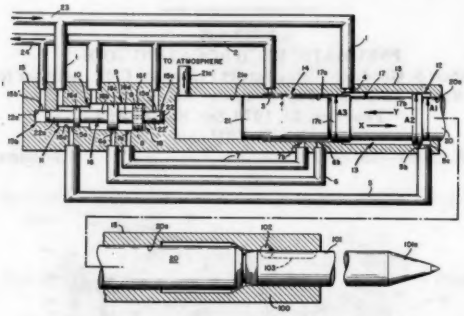
A force balance lever system for controlling a positionable output member as a square or square root function of a variable input force.

3,713,367

FLUID PRESSURE OPERATED MOTORS

Philip Butterworth, Cumberland, England, assignor to Butterworth Hydraulic Developments Limited, London, England

Filed Aug. 27, 1971, Ser. No. 175,685
Int. Cl. F01b 1/02, 7/18; F01l 25/04
U.S. Cl. 91—231 **16 Claims**



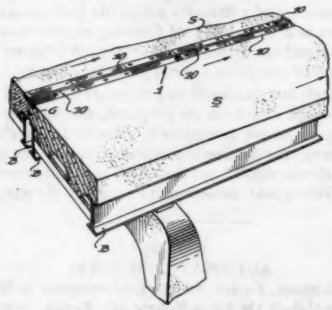
A fluid operated motor having a reciprocating piston with two opposed different effective areas of which the smaller effective area is open to continuous fluid pressure in a constant pressure chamber to pressure bias the piston in one axial direction, the larger effective area communicates with an alternating pressure chamber and in which reciprocation of the piston is achieved by alternately fluid pressurizing and exhausting the alternating pressure chamber by control of valve means which valve means further acts to open communication between the constant pressure and alternating pressure chambers when the piston is moving against its axial biasing so that fluid displaced from the constant pressure chamber enters the alternating pressure chamber. The motor also including a variable volume chamber which is open to exhaust and expands as the piston moves in its bias direction and contracts as the piston moves against its bias direction and the valve means still further acts to open communication between the variable volume chamber and alternating pressure chamber when the variable volume chamber is expanding and to close such communication when the variable volume chamber is contracting so that fluid from the contracting variable volume chamber is delivered to exhaust to alleviate intermittent exhaust back pressure in the motor. An embodiment of the invention includes the motor in a percussive device.

3,713,368

ROAD JOINT SEAL AND END DAM CONSTRUCTION

Donald J. McDowell, Riverside, and Daniel E. Czernik, Hinsdale, both of Ill., assignors to Felt Products Mfg. Co.

Continuation-in-part of Ser. No. 141,518, May 10, 1971, abandoned. This application Oct. 26, 1971, Ser. No. 191,996
Int. Cl. E01c 11/10
U.S. Cl. 94—18 **28 Claims**



A joint seal assembly for adjacent, slightly spaced slabs of roadway and deck structures. A joint seal and end dam includes a pair of elongate elastomeric side pads secured to the upper surfaces of the slabs, and an integral elastomeric bridging joint membrane spanning the gap between the slabs. The joint membrane assumes an upstanding arched configuration in transverse cross section. When the slabs move relative to each other, as at longitudinal, transverse or skewed joints, in all design positions of movement of the joint membrane and the slabs, substantially no reaction force is exerted on the slabs, and the side pads or on the means securing the side pads to the slabs. The end dam is self-cleaning. Such an end dam is made in sections configured to be sealingly secured in an end-to-end array, whereby an end dam assembly of substantial length may be formed.

3,713,369

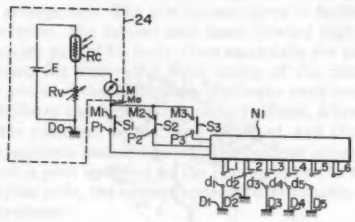
METER COMPENSATION FOR A CAMERA WITH INTERCHANGEABLE LENSES AND FOCUSSING SCREENS

Tatsuo Fujii, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 9, 1970, Ser. No. 87,940
Claims priority, application Japan, Nov. 8, 1969, 44/89062
Int. Cl. G03b 7/04, 19/12; G01j 1/56
U.S. Cl. 95—10 C **3 Claims**

A single-lens reflex camera including an interchangeable focusing screen, each screen having an individually positioned electrical contact, an interchangeable lens, each lens having an individually positioned electrical contact, an exposure measuring device which measures the intensity of the light passing through the lens and focusing screen; a circuit system in the exposure measuring device having terminals for receiving the electrical contacts on the mounting portion of the

camera body for automatically correcting the amount of exposure meter sensitivity represented by the resistance value of a



particular resistor for a particular combination of focusing screen and lens, when such focusing screen and lens are mounted on the camera body.

3,713,370

ARRANGEMENT FOR COUPLING A FLASH BULB HOLDER TO A CAMERA

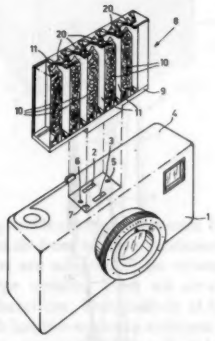
Cornelis Prijn, Emmasingel, Eindhoven, Netherlands

Filed Nov. 2, 1971, Ser. No. 194,954

Claims priority, application Netherlands, Nov. 6, 1970, 7016260

Int. Cl. G03b *15/03, 15/035*

U.S. Cl. 95—11 L **4 Claims**



A connection arrangement for coupling a holder for at least one flash bulb to a camera includes a magnetic system in the camera adapted to cooperate to a ferromagnetic portion of the holder. Symmetrical positioning elements which preferably have a searching construction form part of the holder and enable the holder to be used in two separate orientations which are 180° relative to each other.

3,713,371

AUTOMATIC FOCUSING CAMERA

Makoto Kurihara, and Hideaki Akiyama, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

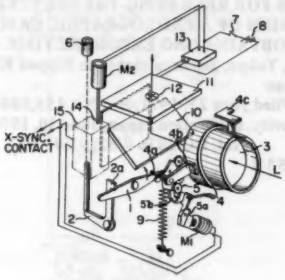
Filed Feb. 9, 1971, Ser. No. 113,859

Claims priority, application Japan, Feb. 14, 1970, 45/12937

Int. Cl. G03b *3/02*

U.S. Cl. 95—44 C **2 Claims**

A mechanical automatic focusing system for cameras which may be energized by, for example, the film winding operation is provided for shifting a camera lens from its infinity focus position to any intermediate proper focus position as far as the closest focus position or vice versa upon release of a shutter release button. A signal from a photoelectrically-powered spatial frequency sensing device, properly positions a locking means to temporarily lock the camera lens at a focusing position as it shifts from an extreme position so that it may focus the sharp image of a subject for a time interval during which a shutter is released. In size and weight the automatic focusing



camera may be comparable to the conventional electronic shutter camera because no electric motor is used for shifting the camera lens. In addition, no direction signal is required for determining whether the camera lens should be shifted forward or backward to focusing position since the lens is always shifted from the same extreme start position to the proper focused position.

3,713,372

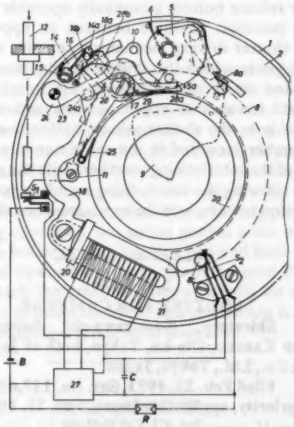
PHOTOGRAPHIC SHUTTER WITH RECIPROCATING SHUTTER BLADE DRIVING MEMBER AND ELECTRONIC TIMING DEVICE

Hermann Schill, Schwarzw, Germany, assignor to Prontor-Werk Alfred Gauthier G.m.b.H., Calmbach/Schwarzwald, Germany

Continuation of Ser. No. 771,502, Oct. 29, 1968, abandoned. This application March 18, 1971, Ser. No. 125,846

Int. Cl. G03b *9/62*

U.S. Cl. 95—53 EB **2 Claims**



A photographic shutter having a driving member which when moved from a normal position moves the shutter blades by means of a reciprocating actuating member first into an open and then into a closed position. An electronic timing

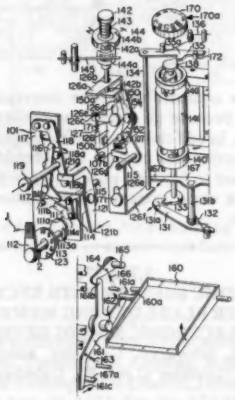
device controls an armature lever which is subject to the action of a return spring. The armature lever cooperates with a lever blocking the actuating member in the open position of the blades for the duration of the timing action. An additional disengaging member is provided which, when the driving member is returned to its normal position, disengages the catch lever.

3,713,373

APPARATUS FOR RELEASING THE SHUTTER DRIVING MECHANISM OF A PHOTOGRAPHIC CAMERA TO OBTAIN LONG EXPOSURE TIME

Akihiko Sato, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed June 23, 1971, Ser. No. 155,880
Claims priority, application Japan, June 30, 1970, 45/64441
Int. Cl. G03b *9/62*, *9/64*
U.S. Cl. 95—53 R **5 Claims**



Apparatus for releasing the shutter driving mechanism of a photographic camera to obtain long exposure time when the camera shutter is set at a B-position having a manually operable shutter release button, a manually operable self-timer, interlocking members movable between an upper position in which the shutter driving mechanism remains charged and a lower position in which the shutter driving mechanism starts exposure and starts the self-timer, the interlocking means being biased towards its upper position and movable to its lower position by the shutter release button, a second shutter release member mounted in the self-timer to release the engagement of the interlocking members with the shutter release button for allowing the interlocking members to move to their upper position to complete the exposure when the set time has elapsed.

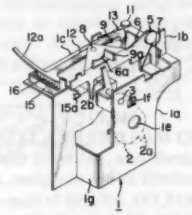
3,713,374

SHUTTER FOR CAMERAS

Yoshitaka Shiratory, Koshigawa-shi, Saitama-ken, and Hirokazu Kaneko, Ota-ku, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1971, Ser. No. 117,658
Claims priority, application Japan, Feb. 21, 1970, 45/16589
Int. Cl. G03b *9/62*
U.S. Cl. 95—59 **4 Claims**

A shutter blade drive lever having a projection is pivotally fixed to an integral flat portion bent at a right angle of a shutter release lever which rotates in parallel with a shutter blade having a projection for engagement with the projection of the drive lever. When the drive lever is moved to its energized position against its bias spring, the release lever is not permitted to rotate so that the projection of the drive lever may be kept out of contact of the projection of the shutter blade. When the shutter release lever is rotated so as to permit the drive lever to return to its initial position from the energized position, the projection of the drive lever moves along a path in which it strikes and swings past the projection of the shutter blade so as to rotate the shutter blade against its bias spring and then to return to its initial position, whereby the shutter is opened and closed. The shutter ensures the smooth and reliable operation and avoids the erratic operation.



3,713,375

MANNEQUIN STRUCTURE

Daniel C. Bianchino, 117 Prescott Road, Concord, Mass.

Filed April 7, 1971, Ser. No. 131,900
Int. Cl. G03b *15/06*
U.S. Cl. 95—82 **14 Claims**

A three-dimensional mannequin structure having a unique costume arrangement disposed thereon for use in photography applications. The mannequin structure is similar to a conventional full-body adult-size mannequin as is commonly employed for displaying wearing apparel with the principal exceptions that it has no head, neck, or arms, and the major portion of the back thereof, extending from the top of the shoulders to the calf regions of the legs, is lacking. In addition, arm and neck cutouts are provided in the regions of the mannequin structure where the arms and neck, respectively, would normally be attached.

To use the above-described mannequin structure in photography applications, a unique costume arrangement, for example, a reproduction of a 1775 Revolutionary War British soldier's uniform, is constructed on the mannequin structure. The costume arrangement has an open, or "backless," portion between the shoulder and waist regions of the mannequin

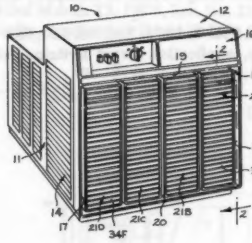
structure. A subject to be photographed stands behind the mannequin structure and partly "dresses" himself in the costume arrangement. In the case of the British soldier costume arrangement, the subject partly dresses himself therein by inserting his arms through the sleeves of the costume arrangement. The arm cutouts serve to facilitate this latter operation. The subject then leans forward slightly such that the upper part of his body, from essentially the shoulders to the waist, fits within the torso cavity of the mannequin structure and such that his neck is within the neck cutout and his chin is above and forward of the neck cutout. After assuming suitable positions for the arms and head, and after a few minor adjustments and additions to the costume arrangement, the subject is photographed by the photographer. In the final photographic print, the subject appears to be actually dressed in a full costume.

3,713,376

AIR-CONDITIONER AIR-DIRECTING MEANS

Clinton E. Ring, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed March 22, 1971, Ser. No. 126,504
Int. Cl. F24f *13/00*
U.S. Cl. 98—110 **1 Claim**



This invention provides improved means for directing the flow of conditioned air from an air-conditioner. The improved air-directing means are adapted to be mounted in a conditioned-air discharge opening from an air-conditioner and readily removed therefrom. They include at least one nozzle-like member which has two opposite ends and an axle on each of them. The axles are journalled for pivotal movement relative to the opening in bearings provided on opposite edges of the opening. At least one of the bearings is slotted to permit easy insertion and removal of one of the axles into and from it. Resilient fastener means are provided for releasably retaining the axle in the slotted bearing.

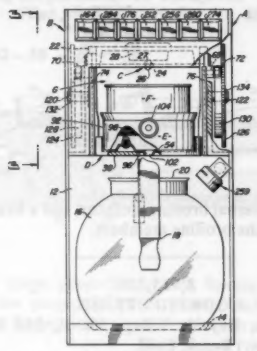
3,713,377

BEVERAGE BREWING DEVICE

Hager F. Arnett, Mansfield, and Reginald A. Smith, Shelby, both of Ohio, assignors to Mansfield Aircraft Products Co., Mansfield, Ohio

Filed March 8, 1971, Ser. No. 122,107
Int. Cl. A47j *31/44*
U.S. Cl. 99—283 **30 Claims**

A beverage brewing device includes an infusion station for receiving an infusion package. The infusion station includes a pair of vertically spaced package engaging members, at least one of which is movable toward the othermember to an infusing position, and away from the other member to a package loading and unloading position. Liquid supply means feeds liquid to the infusion station when the one member is in the infusing position. An electric motor moves the one member, and automatic sensing means senses a predetermined volume of liquid which has passed the infusion station to energize the



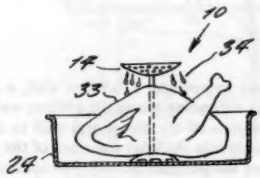
motor for moving the one member from the infusing position to the loading and unloading position.

3,713,378

BASTER AND TENDERIZER

Dexter F. West, and Joseph W. West, both of Oaltewah, Tenn., assignors to James Edward Cobb, Chattanooga, Tenn.

Filed Feb. 18, 1971, Ser. No. 116,379
Int. Cl. A47j *37/00*
U.S. Cl. 99—346 **1 Claim**



A culinary tool for improving the taste of roasting meats and fowl, the device comprising an elongated stem of tubular material which is threaded externally at both ends thereof, the stem being first threadingly secured at one end to a steam pocket plate while the other end of the stem is threadingly engaged to a pointed head or key to permit inserting the stem through a fowl or meat intended to be roasted, after which the key or head is removed and replaced by a basting plate, so that during roasting operation, the steam pocket plate is seated in the gravy at the bottom of the roasting pan and from which the gravy is pushed upwardly through the stem upon the basting plates from which the gravy drips downwardly on top of the fowl or meat so to baste the same and preventing it from drying up, thus producing a tender and tasty food.

3,713,379

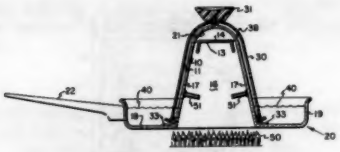
BACON BROILER

Edward M. Gordy, 12 North Clermont Avenue, Margate, N.J.

Filed Sept. 17, 1971, Ser. No. 181,428
Int. Cl. A47j *37/00*
U.S. Cl. 99—349 **10 Claims**

An improved apparatus for broiling bacon over a domestic gas or electric range. The apparatus consists of one or more hollow vertical broiling members mounted above a water

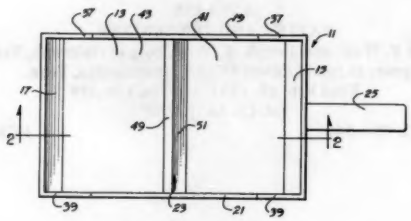
bearing receptacle. Heat sinks are fastened to the internal surfaces of the broiling members so as to create a uniform temperature on the external broiling surfaces, and a heat deflector is mounted inside the broiling members.



3,713,380
COOKING UTENSIL

Robert S. Bardin, Bayside Village No. 4, 300 East Coast Highway, Newport Beach, Calif.

Filed April 27, 1970, Ser. No. 31,929
Int. Cl. A47j 37/10
U.S. Cl. 99—422 **4 Claims**



A cooking utensil comprising a bottom wall, a peripheral wall, and a spillway extending along the bottom wall between first and second regions of the peripheral wall to define first and second compartments. At least a section of the spillway is of lesser height than the peripheral wall. The spillway has first and second surfaces confronting the first and second compartments, respectively. The first surface and the bottom wall define a larger included angle than the second surface and the bottom wall.

ERRATUM

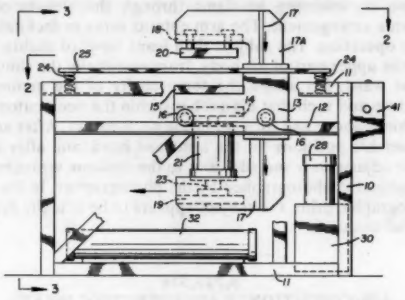
For Class 99—580 see:
Patent No. 3,713,468

3,713,381
ROOF TRUSS MACHINE

Robert E. Mort, and George E. Creaser, both of Sharon, Pa., assignors to Inter-Lock Steel Company, Inc., East Palestine, Ohio

Filed Dec. 8, 1970, Ser. No. 96,027
Int. Cl. B30b 1/32
U.S. Cl. 100—100 **2 Claims**

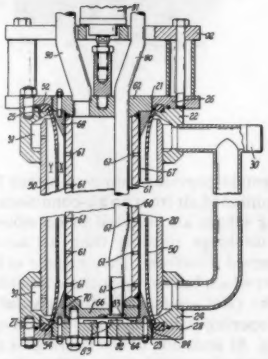
A machine for assembling wood frames such as roof trusses made of wood members abutted together and secured by spiked truss connector plates consists of a hydraulically actuated C-shaped clamping press having upper and lower press plates and being movably mounted for horizontal motion on a supporting frame. Movable support means is provided for the wood members to position the same in spaced relation to the upper and lower press plates of the C-shaped clamping press to permit quick and easy placement of the spiked truss connecting plates. A hydraulic actuating system including an accumulator is provided to actuate the C-shaped clamping press in a hammer like blow driving the spiked truss connector plates into the wooden members.



3,713,382
TUBE PRESSURE FILTERS

Ralph Derek Gwilliam, Cornwall, England, assignor to New English Clays Lovering Pochin & Company Limited, Cornwall, England

Filed Feb. 1, 1971, Ser. No. 111,482
Claims priority, application Great Britain, Feb. 11, 1970, 6,695/70; July 21, 1970, 35,374/70
Int. Cl. B30b 9/06, 5/02
U.S. Cl. 100—112 **8 Claims**



The sealing of the inner compartment of a tube pressure filter, which comprises a pair of co-axial tubular bodies displaceable relative to one another and forming between them an annular chamber which is effectively divided by an impermeable elastic sleeve secured to the outer tubular body into inner and outer compartments, is effected at least in part by the impermeable elastic sleeve.

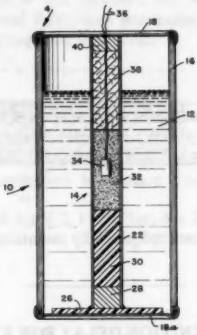
3,713,383
DISPERSAL TECHNIQUE FOR CW/BW AGENTS

Frank G. Crescenzo; William A. Gey, and Armin T. Wiebke, all of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 16, 1966, Ser. No. 551,842
Int. Cl. F42b 25/12
U.S. Cl. 102—6 **3 Claims**

Dispensing canister for BW-CW agents characterized by the agent being in gel form of certain viscosity and a central

burster tube containing a propellant for producing pressure of



relatively low order, to effect dispersal of the gel into relatively large particles.

3,713,384

BLASTING METHOD

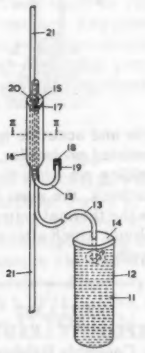
Brian Turnbull, Troon, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed March 23, 1970, Ser. No. 21,904

Claims priority, application Great Britain, March 31, 1969, 16,615/69

Int. Cl. F42d *1/04*

U.S. Cl. 102—27 R 9 Claims



A blasting method and primer assembly for blasting agents wherein the primer assembly comprises a high explosive priming charge, a connector and an intermediate length of detonating cord, the connector being adapted to hold the detonating cord in close lengthwise proximity to and slidably movable along a downline of detonating cord.

3,713,385

ELECTROEXPLOSIVE DEVICES

Albert Leonard Lovecy, London, England, assignor to Minister of Technology in Her Britannic Majesty's Government, London, England

Filed Jan. 30, 1970, Ser. No. 7,239

Int. Cl. F42c *19/12*

U.S. Cl. 102—28 R 7 Claims

An electroexplosive device consisting of an intimate mixture of an explosive substance and an electrically conducting material in a fibrous form in sufficient proportion and so distributed to provide an electrically conducting path through the mixture and means for passing an electrical current through the mixture to initiate the explosive substance.

3,713,386

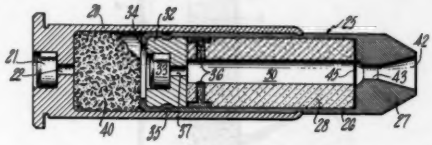
RANGE LIMITED PROJECTILE SYSTEM

Melvin Zaid, Old Westbury, N.Y., assignor to Colt Industries Operating Corporation, New York, N.Y.

Filed June 22, 1970, Ser. No. 48,084

Int. Cl. F42b *5/10*

U.S. Cl. 102—38 18 Claims



A close range projectile system having a reverse thrust rocket in the projectile which permits maximum projectile velocity and hitting power over short range only.

3,713,387

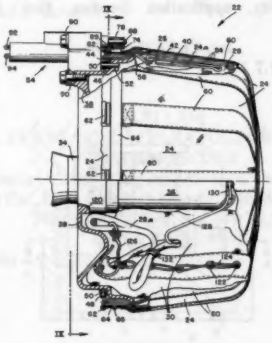
HIGH SPEED FAIL SAFE WEAPON RETARDING SYSTEM

Raymond E. Karp, San Marino, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed March 20, 1969, Ser. No. 808,725

Int. Cl. F42b *25/02*

U.S. Cl. 102—4 8 Claims



An improvement for an aerodynamic missile, such as a torpedo, wherein the missile has a main parachute which is contained by a container at the aft end thereof, the improvement including an initial stabilizing and velocity retarding parachute releasably folded about the container; and means releasably retaining the stabilizing parachute to the container. The container may be constructed of a flexible material such as cloth, and an improved means may be provided for releasing the main parachute from this container.

3,713,388

PROJECTILE FOR SMOOTH BARREL HUNTING GUNS OR RIFLES, WITH AUXILIARY WAD PROVIDED WITH HELICAL SIDE TABS

Emanuele Pontoriero, Aereoporto, Pantelleria, Italy

Filed Oct. 28, 1970, Ser. No. 84,560

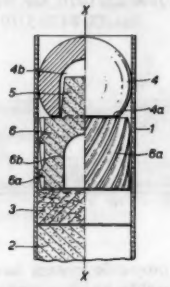
Claims priority, application Italy, Oct. 28, 1969, 60009 A/69

Int. Cl. F42b *7/00*

U.S. Cl. 102—38 4 Claims

The invention concerns a projectile for smooth barrel hunting guns or rifles. The projectile is inserted into a cartridge housing the charge, the priming system and sealing wad of limited thickness. The projectile comprises a substantially

spherical body made of lead or other suitable material and is provided in its lower section with a flat chamfered base. The spherical projectile includes an internal cavity connected to



an auxiliary wad, cylindrical in shape and containing helical tabs formed by grooves. The diameter of the projectile and the auxiliary wad correspond to the internal diameter of the cartridge which houses the projectile.

3,713,389

IGNITION DEVICE IN A ROCKET-ASSISTED PROJECTILE

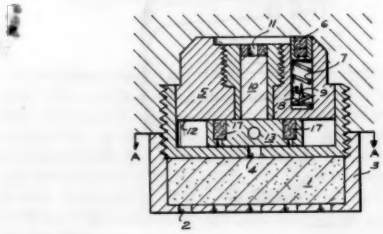
Karl Erik Waldemar Hjelm, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Oct. 12, 1970, Ser. No. 80,069

Claims priority, application Sweden, Oct. 17, 1969, 14249/69

Int. Cl. F42b *19/08*

U.S. Cl. 102—49.7 **7 Claims**



An ignition device for a rocket-assisted projectile to be fired from a gun comprises a detonator which when activated ignites a delay composition of a kind burning without flame and without generating hot gases, and a support for a composition of the type burning when activated non-explosively with a hot flame for a prolonged period of time. This support is movable by the centrifugal force acting upon it when the projectile is fired and spins, from a rest position to an active position in which the composition on the support is ignited by the heat of the burning delay composition. The burning of the composition on the support member in turn, ignites via an also non-explosively burning priming charge the propellant fuel of the rocket motor of the rocket-assisted projectile.

3,713,390

ORDNANCE SECTION CABLE HARNESS

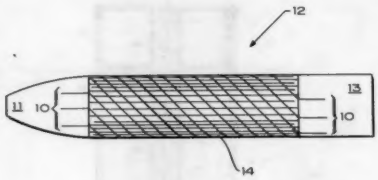
Hans D. Pieper, Riverside, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed May 7, 1971, Ser. No. 141,363

Int. Cl. F42b *13/48*, *15/00*

U.S. Cl. 102—67 **2 Claims**

An ordnance section cable harness which extends over a continuous rod warhead wherein the wires of the cable harness are helically wound around the continuous rod warhead. In this way an equal mass is presented to all rods upon expansion of the continuous rod, thereby maintaining the continuity of the rod.



3,713,391

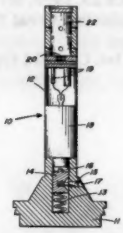
ELECTRONIC IGNITION DELAY FOR 5"/38 AND 5"/54 ROCKET ASSISTED PROJECTILES

Lilburn G. Stout, Jr., Falmouth; Robert F. Butler, and Thomas S. Smith, both of Fredericksburg, all of Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 11, 1969, Ser. No. 889,855

Int. Cl. F42c *11/06*, *11/00*, *9/00*

U.S. Cl. 102—70.2 A **5 Claims**



To provide reliable and accurate ignition timing for 5"/38 and 5"/54 rocket assisted projectiles, a mass is situated so as to shear loose its holding pin when the projectile is gun fired. At termination of setback, the mass is moved by a spring to percussively actuate the thermal battery. The battery provides power to a timing circuit which after a suitable delay switches current through a squib.

3,713,392

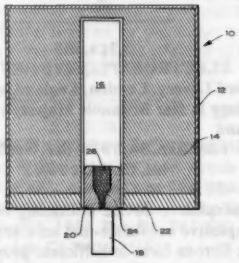
EXPLOSIVE LEAD PLUG

Kenneth C. Parsons, Columbia Heights, Minn., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 9, 1971, Ser. No. 113,866

Int. Cl. F42b *3/10*

U.S. Cl. 102—70 **2 Claims**



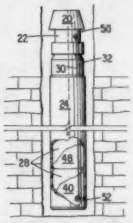
A metal fuse extension with an explosive-filled channel passing through it. The channel is small on one end and large

on the other end. The small end is adjacent a fuse and the large end is adjacent a burster charge. Upon detonation of the explosive material in the channel, the small end is sealed closed due to metal flow, thus preventing a backfire of the burster charge through the small end.

3,713,393
IGNITER MECHANISM FOR SOLID PROPELLANTS UNDER HIGH FLUID HEAD

Donald J. O'Connor, Seymour, Ind., and Clarence R. Fast, Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed April 2, 1970, Ser. No. 25,063
Int. Cl. F23q 7/02
U.S. Cl. 102—70 **10 Claims**

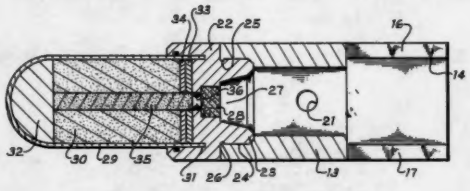


An igniter is describe capable of operating at high bottom-hole pressures, i.e., greater than 2,000 psi. To prevent the influx of well fluids into the recess which has been drilled into a portion of the main propellant, it is filled with a plastic or viscous propellant. A flame squib or resistance wire is immersed in the viscous propellant. Any pressure exerted by well fluids against the viscous propellant serves to force it into void spaces around the flame squib thus protecting the squib as well as the surrounding primary propellant from direct contact with aqueous well fluids.

3,713,394
SMOKE SIGNAL DEVICE

Sherman E. Dare, Wheatland; Davey S. Haas, Bloomington; Stanley J. Herold, Switz City; Steven R. Norris, Wheatland; Terry V. Patterson, Bloomington, and Robert E. Sloan, Linton, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy

Filed March 1, 1971, Ser. No. 119,765
Int. Cl. F42b 11/24
U.S. Cl. 102—90 **4 Claims**

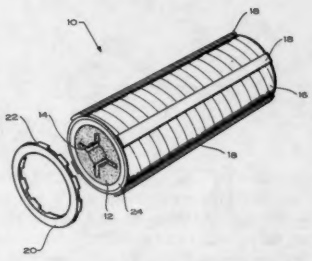


A smoke signal device adaptable for attaching to a pistol and being launched by firing the pistol. An adapter is provided which slip-fits onto a pistol barrel and a base having a percussion primer therein is removably attached to the adapter. A case having a quantity of smoke-producing composition therein is attached to the forward end of the base and an ignition train is provided to ignite the smoke-producing composition upon detonation of the percussion primer. The case is separated from the base upon ignition and a trailing smoke signal is emitted from the case during flight.

3,713,395
SOLID PROPELLANT

David W. Carpenter, China Lake, and Jack A. Yeakey, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 28, 1971, Ser. No. 138,022
Int. Cl. F42b 1/00
U.S. Cl. 102—103 **1 Claim**

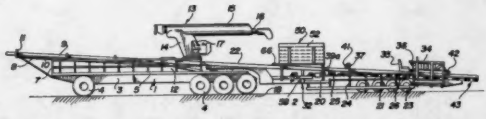


The propellant grain of a rocket motor is improved by providing flame resistant adhesive strips longitudinally on the outer periphery of the grain for centering the grain in the motor case and to allow for equal distribution of chamber pressure around the exterior of the grain. The results are also enhanced by addition of a slotted pressurization ring at the forward end of the grain.

3,713,396
SINGLE TURNTABLE APPARATUS FOR POSITIONING RAILROAD TIES

Helmut Gustav Colius, Calgary, Alberta, Canada, assignor to Mannix Co., Ltd., Calgary, Alberta, Canada

Filed Oct. 2, 1970, Ser. No. 77,555
Int. Cl. E01b 29/06
U.S. Cl. 104—9 **4 Claims**

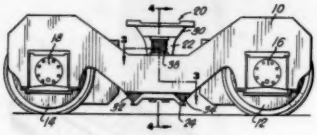


A tie delivering system for use in an apparatus for constructing railroad tracks and the like comprising a support structure including a conveying path, means for conveying a plurality of longitudinally spaced ties along said path, means for delivering a pair of laterally spaced rails above said ties such that the rails are initially vertically spaced above the ties and come to rest on the ties and means for delivering an assembled track section from the path. The ties delivery system includes a ties storage structure mounted on said support structure at an elevation higher than the conveying means and arranged to hold ties in a position parallel to the rails, an elongated tie receiving chute extending downwardly from said tie support structure between and parallel to said rails, means associated with said chute for releasably holding a tie therein and a vertically movable tie receiving turntable positioned below said chute for receiving a tie released from the chute, lowering the tie to a position below said rails and above said conveying path, rotating the tie through 90° and depositing the tie on the conveyor path at right angles to the rails.

3,713,397
MOTORIZED RAILWAY TRUCK

John Henry Parker, St. Laurent, Quebec, and Frank Thomas McInerney, Bruno, Quebec, both of Canada, assignors to MLW-Worthington Limited, Montreal, Quebec, Canada

Filed Jan. 11, 1971, Ser. No. 105,284
Int. Cl. B61c 9/50; B61f 3/04, 5/20
U.S. Cl. 105—136 7 Claims

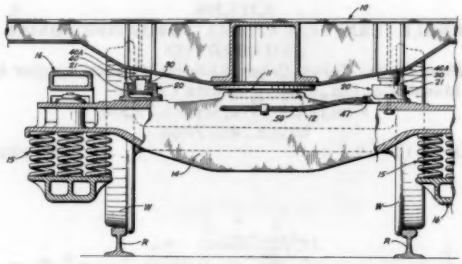


A truck assembly adapted to maintain substantially equal loading on the motorized axles of a two axle truck by resiliently suspending said truck on a central post, the resilient suspension permitting rotation of the truck about a horizontal axis located approximately at ground level and in line with the vertical axis of rotation of the truck from about the post.

3,713,398
FLUID RAILWAY SIDE BEARINGS

John A. Zupez, Saint Louis, Mo., assignor to Abex Corporation, New York, N.Y.

Filed Aug. 29, 1969, Ser. No. 854,172
Int. Cl. B61f 5/14; F16c 17/04; F16f 9/10
U.S. Cl. 105—199 CB 2 Claims



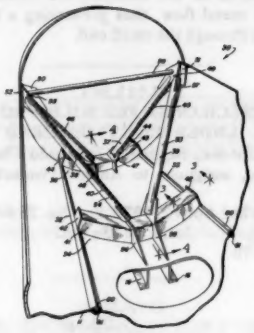
Rocking motion of a railroad car body, supported on a truck bolster, is reduced and absorbed by a cylinder and a plunger side bearing assembly arranged on opposite sides of the bolster center plate. The cylinders have chambers filled with liquid in communication with one another through restricted orifices and an interconnecting conduit.

3,713,399
TANK CAR

Henry Bembridge, Oakville, Ontario, and Geoffrey C. Venn-Brown, Cooksville, Ontario, both of Canada, assignors to Procor Limited, Oakville, Ontario, Canada

Filed June 16, 1971, Ser. No. 153,719
Int. Cl. B61d 5/02, 5/06
U.S. Cl. 105—358 18 Claims

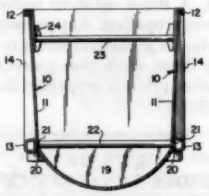
A hopper-type railroad tank car having a longitudinally extending tank shell supported upon a pair of shortened stub center sill assemblies, one at each end, and a plurality of hopper compartments spaced at intervals along the length of the car. Each hopper compartment communicates with a bottom outlet, cut-out of the tank shell. The inboard edges of the center sills are positioned outboard of the respective end-most hopper outlets. An end reinforcing structure is provided to transmit horizontal and vertical loads from the center sills to the tank shell and to transmit bending moments applied to the end of the car to the tank shell.



3,713,400
RAILWAY CAR

Anthony Teoli, 174 Sunderland Avenue, Pointe Claire, Quebec, Canada

Filed June 29, 1970, Ser. No. 50,807
Claims priority, application Canada, April 14, 1970, 080117
Int. Cl. B61d 17/10, 15/00
U.S. Cl. 105—406 R 5 Claims

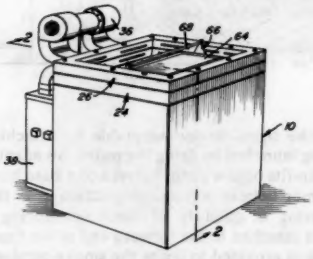


A gondola type railway car has a bottom plate of parabolic shape extending down between the wheel assemblies or trucks of the car and free of external and internal reinforcement, giving maximum capacity with minimum car weight.

3,713,401
AIR-FLOW OVEN

Cloise M. McClurkin, 1821 North Street, S. E., Decatur, Ala.

Filed March 23, 1971, Ser. No. 127,205
Int. Cl. A21b 3/06
U.S. Cl. 107—57 B 18 Claims



An oven for heating and maintaining heated food stuff wherein free access to the interior thereof is provided through

an open port, either at the top or bottom thereof. A dual air curtain is provided about the access port or opening and includes an inwardly directed curtain defined by circulating oven heated air and a second overlying outer curtain defined by a blowing of the ambient air thereacross. THe food is maintained on a vertically traveling rack, the individual pans of which are removable for a selective removing of the food stuff.

3,713,402

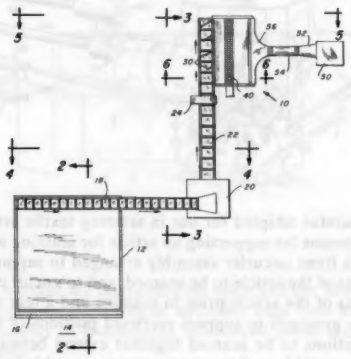
SOLID WASTE INCINERATOR AND PROCESS

Mary E. Ahrend, 1165 East 24th Place, Tulsa, Okla.

Filed Oct. 29, 1970, Ser. No. 85,094

Int. Cl. F23g *5/00*

U.S. Cl. 110—8 R **8 Claims**



An open pit incineration system for solid waste and refuse utilizes a high velocity air curtain to effect not only complete combustion of solid materials into gaseous products of combustion but to prevent the escape of products of incomplete combustion into the atmosphere. The residue or incombustible solid material remaining is removed from the pit. The invention further incorporates a waste disposal system and process to efficiently collect and transfer the waste material into the incineration pit.

3,713,403

REFUSE DESTRUCTOR

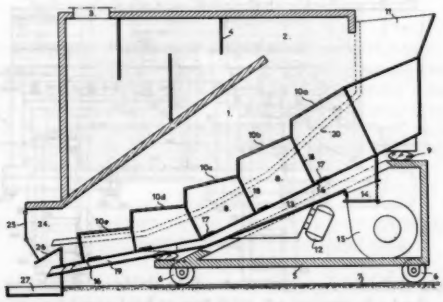
Claude Maille, 96 Scarcelles, France, assignor to Stein Industries, Paris, France

Filed Jan. 18, 1971, Ser. No. 107,031

Claims priority, application France, Aug. 4, 1970, 7029153

Int. Cl. F23h *7/00*

U.S. Cl. 110—32 R **9 Claims**



A refuse destructor of the type including a furnace inside which a casing carries a succession of stepped grates through which the incinerated garbage drops into a stream of air so as to be conveyed towards an ash-pit, said grates sloping with reference to a horizontal plane at an angle which decreases from the rearmost towards the foremost grate.

3,713,404

PLANT HUSBANDRY

Harry F. Lavo, Stamford, Conn., and Charles J. Cante, Bayside, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed April 16, 1971, Ser. No. 134,865

Int. Cl. A01c

U.S. Cl. 111—1 **13 Claims**

A high-expansion foam is employed as a vehicle for applying seeds, fertilizers, and other biological and chemical agents to plant life and soil. The long lasting foam is mechanically generated with a portable hand-held water powered generator from a foam-providing concentrate within which is incorporated the plant and/or soil agent. The foam-providing concentrate and the method of applying the foam are especially adaptable for employment with a residential-type garden hose utilizing typical residential water supply and pressure systems.

3,713,405

WORK CLAMP FOR SEWING MACHINES

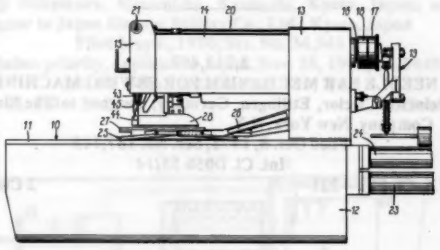
Nereo Bianchi, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy

Filed Jan. 5, 1971, Ser. No. 104,049

Claims priority, application Italy, Jan. 28, 1970, 42901 A/70

Int. Cl. D05b *27/04, 29/08*

U.S. Cl. 112—76 **3 Claims**



A work clamp for holding a fabric in tensioned conditioning during the sewing of stitches thereon. The clamp comprises opposed pivoted members which incline relative to the sewing plane when the clamp is lifted to an inoperative position. These members gradually grip the work fabric and tension it as they assume a parallel position relative to the sewing plane in consequence of the clamp being lowered to a working position.

3,713,406

AUTOMATIC MACHINE FOR SEWING POCKET PIECES AND THE LIKE TO GARMENTS

Menachem Futter, Union, N.J., assignor to The Singer Company, New York, N.Y.

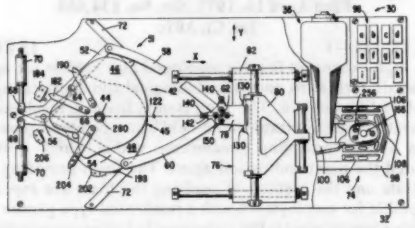
Filed June 23, 1971, Ser. No. 155,927

Int. Cl. D05b *21/00*

U.S. Cl. 112—121.15 **13 Claims**

A machine for automatically sewing a pocket piece to a garment wherein the pocket is loaded onto a clamp in which the pocket shape is set and a sewing margin established. The clamp is connected to a fixture driven on an X-Y table and activated by a linkage assembly whose movement follows that of

conjugate cams. The two cams are identical and are mounted on a common shaft in displaced configuration upon a line of symmetry to form a coordinate drive system which drives the clamp to prescribe a predetermined pattern. An adjustable bracket connects the fixture to the linkage assembly. The sewing machine and the conjugate cams are synchronously driven from a variable speed motor by timing belts. A pair of holding plates are used in the clamp to prevent the pocket edges from



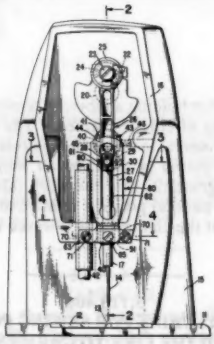
becoming unfolded while the pocket is in the clamp. The holding plates include an inner plate and an outer plate, interconnected to each other by a spring cartridge. Once the folding operation is completed, the clamp is moved to the sewing position for the start of the sewing cycle wherein the folded pocket will be sewn to a shirt front which has been placed beneath the pocket clamp before the pocket piece was inserted into the clamp.

3,713,407

NEEDLE BAR MECHANISM FOR SEWING MACHINES

Heinrich Ciecior, Ettlingen, Germany, assignor to The Singer Company, New York, N.Y.

Filed Oct. 8, 1971, Ser. No. 187,715
Int. Cl. D05b 55/14
U.S. Cl. 112—221 **2 Claims**



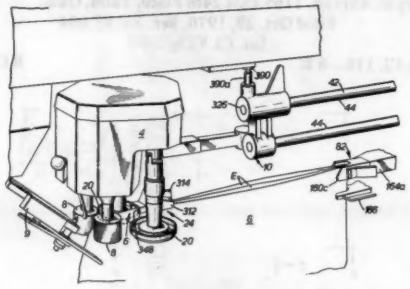
A mechanism for supporting a sewing machine needle bar for endwise reciprocation in which the needle bar is reciprocatable in a gate which is adjustably secured in the machine frame by a slotted guide member which stabilizes the needle bar drive link. Fastening of the slotted guide member in the machine frame simultaneously effects alignment of the slotted guide with the needle bar and clamping of the needle bar gate relatively to the machine frame.

3,713,408

SEAMING TEXTILE ARTICLES

Leslie Roy Deeks, Wokingham, and Michael Henry Cox, High Wycombe, both of England, assignors to Detexomat Limited, High Wycombe, Buckinghamshire, England

Filed July 15, 1969, Ser. No. 841,952
Claims priority, application Great Britain, July 26, 1968, 35,811/68; Oct. 15, 1968, 48,733/68; Jan. 20, 1969, 3,243/69
Int. Cl. D05c 9/10
U.S. Cl. 112—121.15 **13 Claims**



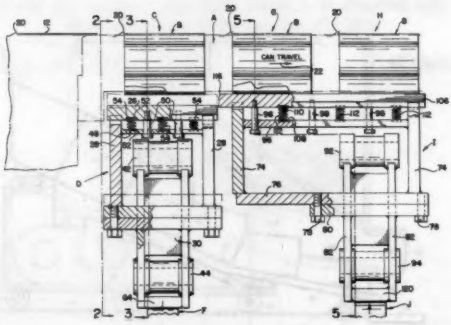
Apparatus adapted for use in seaming textile articles comprises means for supporting an article for seaming which comprises a front uncurler assembly arranged to support forward portions of the article to be seamed, and to uncurl curled edge portions of the article prior to seaming and a rear support assembly arranged to support rearward portions of the article; the portions to be seamed together extend between the uncurler assembly and the rear support assembly in the operation of the apparatus and the two assemblies are movable between rearward positions in which the article is loaded onto the support assemblies and forward positions in which the article is fed for seaming. The apparatus also comprises means for applying tension between the front and rear support assemblies and thus to the portions of the article to be seamed, and means for correcting misalignment between the edge portions to be seamed.

3,713,409

APPARATUS AND METHOD FOR BONDING ADHESIVE SEAMS ON CAN BODIES

Eugene W. Heniser; James W. Jensen, and Bernard K. Hook, all of Hastings, Mich., assignors to Gulf & Western Industrial Products Company, Salem, Ohio

Filed Sept. 9, 1971, Ser. No. 179,108
Int. Cl. B21d 51/26
U.S. Cl. 113—12 **11 Claims**

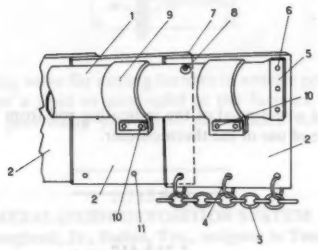


Can bodies have side seams defined by overlapped side edges of a blank with adhesive interposed therebetween. The seam is bumped and held with variable force as can bodies are moved from station-to-station along a mandrel.

3,713,410
FLOATING BARRAGE

Roger Ducrocq, and Charles Moreau, both of Clermont-Ferrand, France, assignors to Pneumatiques Caouthchouc Manufacture Et Plastiques Kleber-Colombes, Colombes, France

Filed March 22, 1971, Ser. No. 126,511
Claims priority, application France, March 20, 1970, 7010268
Int. Cl. B63b *35/00*
U.S. Cl. 114—.5 T **8 Claims**

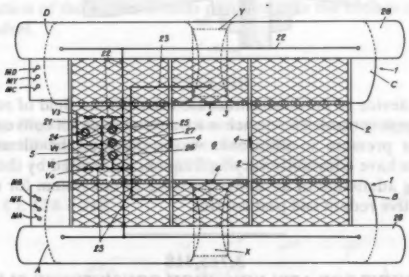


Floating barrage for containing oil spills and the like comprises components consisting of inflatable bags from each of which a plurality of overlapping interlinked panel members are suspended.

3,713,411
SUBMERSIBLE CATAMARAN FOR THE PLACEMENT AND WITHDRAWAL OF PACKAGES ON A WATER BOTTOM

Rene F. Bordessoule, 78 Carrieres sur Seine; Andre J. Kermabon, 13 Marseille 9e, and Serge De Vera, 95 Garces les Gonesse, all of France, assignors to Compagnie Francaise des Petroles, Paris and Comex-Equipment, Marseille, France

Filed Feb. 10, 1971, Ser. No. 113,047
Claims priority, application France, Feb. 11, 1970, 7004774
Int. Cl. B63g *8/00*
U.S. Cl. 114—16 E **8 Claims**

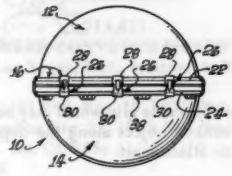


A submersible vehicle of the catamaran type which is used to raise and lower load to and from the bottom of a body of water. The vehicle comprises two ballasts tank held together by beams and a platform position on the beams. The platform has an open center area through which the loads are attached to or separated from the vehicles. The vehicle is raised or lowered by forcing air into or expelling air from the ballasts tank.

3,713,412
DEEP OCEAN SUBMERSIBLE

Anthony P. Ianuzzi, Catonsville, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 15, 1971, Ser. No. 134,244
Int. Cl. B63g *8/00*
U.S. Cl. 114—16 R **9 Claims**

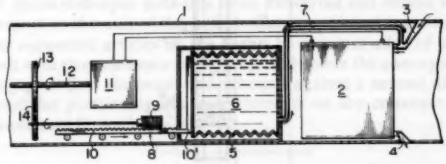


A deep ocean submersible including a pair of glass shells which are adapted to mate with one another about their rims to form a submersible hull; each shell having a peripheral lip which extends outwardly from the rim thereof; an elastomeric band mounted to each respective lip; and means for clamping the bands so that the shells can be tightly retained along their rims.

3,713,413
WATER CIRCULATING TYPE BATTERY USED IN TORPEDO OR THE LIKE

Ryoji Nakamura, Minami-ku, Kyoto-shi, Kyoto, Japan, assignor to Japan Storage Battery Co., Ltd., Kyoto, Japan

Filed May 6, 1970, Ser. No. 34,941
Claims priority, application Japan, Nov. 25, 1969, 44/94495
Int. Cl. F42b *19/24;* **H01m** *7/00, 7/02*
U.S. Cl. 114—20 R **6 Claims**



For continuously supplying a constant amount of acid from an acid tank to sea water or fresh water forming an electrolyte of a water circulating type battery to be used in a torpedo or the like regardless of the water pressure acting on the related parts of the battery depending on the operational depth of the torpedo or the like, an acid supplying device is driven by an electric motor energized from the water circulating type battery.

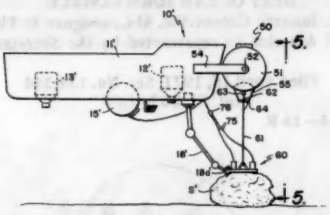
3,713,414
SYSTEM FOR ATTACHMENT TO AND LIFTING OF OBJECTS FROM DEEP WATER

William J. G. Wischhoefer, Fairfax County, and William H. Hunley, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 26, 1965, Ser. No. 483,908
Int. Cl. B63c *7/26;* **B63g** *8/40*
U.S. Cl. 114—50 **17 Claims**

A deep water recovery system comprising a submersible vehicle and associated equipment, including an object at-

tachment tool for attaching to sunken objects, a messenger line and buoy arrangement having an automatic attachment



means and a hoisting cable grip which may be guided from the surface to the sunken object along the deployed messenger line for automatic attachment.

3,713,415

SHIP MOORING ARRANGEMENT AND A SUBMERGED OIL STORAGE TANK

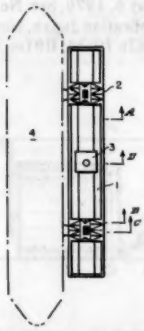
Yukio Arita, and Katsuya Ninomiya, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1971, Ser. No. 118,921

Claims priority, application Japan, March 5, 1970, 45/18304

Int. Cl. B63b *21/04, 21/00*

U.S. Cl. 114—230 **2 Claims**



A ship mooring arrangement comprising a movable fender system capable of varying the spring constant optionally by selecting the dimensions and shapes of a fender mechanism and a ballast tank type of weight, said weight is so constructed to be filled with water and to be sunk, a storage tank fixed at the sea bottom by means of the anchoring piles, a main frame secured to the foot of said oil storage tank by fixing rigidly the posts of said frame to said anchoring piles.

3,713,416

DISPOSABLE THERMOMETER STRUCTURE

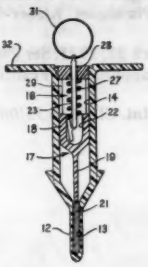
Anthony J. Volk, 173 East Syracuse St., Turlock, Calif.

Continuation-in-part of Ser. No. 122,604, March 1, 1971. This application April 3, 1972, Ser. No. 240,365

Int. Cl. G01k *11/06*

U.S. Cl. 116—114.5 **4 Claims**

A simple thermometer structure having an indicating rod adapted to extend therefrom and to move inwardly of a tubular housing with increasing temperature. The thermometer is set for operation by an internal latching arrangement operable



by manual withdrawal of the indicating rod from the housing at the time of use of the thermometer.

3,713,417

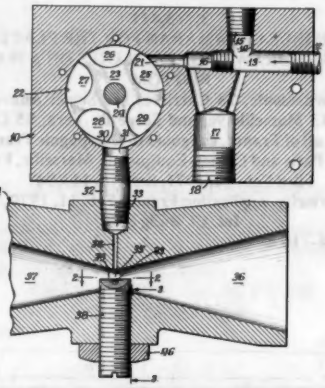
AIR OPERATED ULTRASONIC TRANSDUCER

Michael E. Shugart, 3216 South Harlem Avenue, Riverside, Ill.

Filed July 26, 1971, Ser. No. 165,479

Int. Cl. B06b *3/00*

U.S. Cl. 116—137 A **10 Claims**



A device to produce ultrasonic waves in the field of rodent and pest control. The device is a transducer which converts air under pressure to ultrasonic waves. Further the ultrasonic waves have constantly varying frequencies created by the pulsating admission of air under pressure to the system for more effective rodent and pest control.

3,713,418

MACHINE FOR APPLYING HIGH CONSISTENCY FLUIDS AND SEMI-SOLIDS TO BAKERY AND OTHER PRODUCTS

Walter L. Griffith, 51 E. Cavalier Road, Monroe County, N.Y.

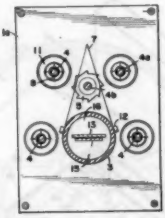
Filed July 1, 1970, Ser. No. 51,604

Int. Cl. B67d *3/00*; A23g *3/20*; B05c *5/00*

U.S. Cl. 118—15 **3 Claims**

A machine consisting of a metal framework holding a tubular dispensing valve having a longitudinal partition. High con-

sistency fluids or semi-solids are pumped into the tube below the partition and through openings in the partition and out a plurality of nozzles in the tube located above the partition. Cutting blades are positioned along a shaft positioned above



the dispensing valve for cutting furrows in articles prior to the depositing of a fluid or semi-solid in the furrows. Rotating shafts with protruding pins move the articles through the machine.

3,713,419

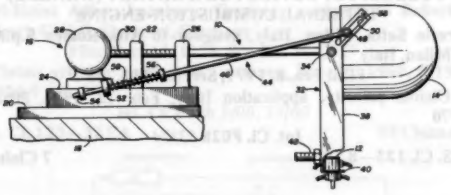
METAL OXIDE DEPOSITION SYSTEM

Carl M. Skooglund, Jr., Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 808,894, March 20, 1969, abandoned. This application Feb. 19, 1971, Ser. No. 117,150

Int. Cl. C23c *11/00*

U.S. Cl. 118—47 **6 Claims**



A system for distributing silicon dioxide particles produced by a hydrolysis torch over the surface of a deposition mandrel. The system includes a drive mechanism for rotating and translating the mandrel past the torch, a bell crank for pivotally supporting the torch and a lost motion drive link for interconnecting the drive mechanism and the bell crank. As the drive mechanism rotates and translates the mandrel, the drive link and the bell crank move the torch along a line extending parallel to the surface of the mandrel. This assures uniform distribution of the silicon dioxide particles over the surface of the mandrel.

3,713,420

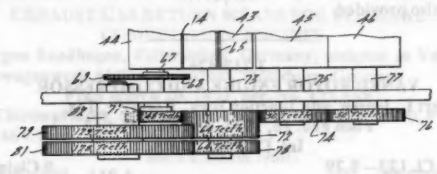
WEB PRINTING MEANS

Ernst Pfaffle, Neuffen-Wuerttemberg, Germany, assignor to Hans Sickinger Company, Pontiac, Mich.

Filed Jan. 21, 1971, Ser. No. 108,482

Int. Cl. B05c *1/08*; F16h *35/02*

U.S. Cl. 118—212 **7 Claims**



Means for printing margin lines on a web of ruled paper to be cut into multiple-leaved sheets, in which a trim allowance is to be provided at the ends of each sheet. The means comprises a margin line printing roll having a plurality of equidistantly spaced ridges. The roll is driven by a gear the teeth of which have a predetermined pitch, except for one section in which there is a larger pitch. The margin lines will be printed at even intervals during the time the roll is driven by the teeth of predetermined pitch, but with the paper moving at a constant speed, a slightly greater interval will occur between margin lines during the time the roll is driven by the tooth section of larger pitch. Thus, the web may later be cut to form sheets each of which has a trim allowance at the outer edges thereof. The sheet is later cut into individual leaves.

3,713,421

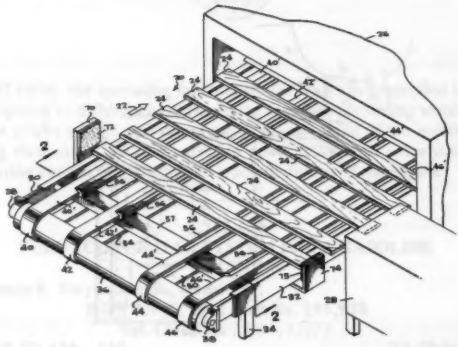
DRYER CONVEYOR MEANS

James T. Rash, Las Vegas, Nev., assignor to Mouldings, Inc., Marion, Va.

Division of Ser. No. 91,099, Nov. 19, 1970, Pat. No. 3,650,377. This application Dec. 22, 1971, Ser. No. 210,726

Int. Cl. B05c *11/12, 3/10*

U.S. Cl. 118—404 **3 Claims**



A belt type conveyor is provided in which the upper flights of plural conveyor belts ride in an elongated slot canted with respect to the axis of the belt so that line contact is provided for supported articles on the flights by a corner edge of each belt with strip elements being projected above the conveyor to engage a first abutment and rebound against a second abutment for positioning the strip elements on the conveyor for movement through a dryer.

3,713,422

APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE BY LIQUID DEVELOPMENT

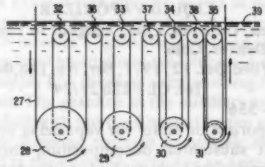
Masamichi Sato, and Osamu Fukushima, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed March 10, 1971, Ser. No. 122,692

Claims priority, application Japan, March 10, 1970, 45/20362

Int. Cl. G03g *13/00*; B05b *5/02*

U.S. Cl. 118—637 **6 Claims**



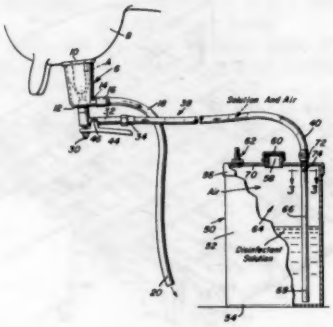
A development device of an electrostatic latent image wherein rotatable and cylindrical development electrodes

comprising the conductive center portion which has a small radius and will face to an electrostatic latent image on a flexible electrophotographic material, and two flange portions which have a large radius respectively and will support the both ends of said material are placed such that differences between said radius of the center portion and said radius of flange portions become smaller with the proceeding of the development, thereby a print can be made with extremely small halos, streaks, fogs and edge effects.

3,713,423
UDDER AND TEAT CLEANSING APPARATUS AND SANITIZER

Anders V. Sparr, Sr., Rte. 2, Waupun, Wis.

Filed Jan. 8, 1971, Ser. No. 105,037
Int. Cl. A61d *11/00*; **A61n** *11/02*
U.S. Cl. 119—1 **6 Claims**



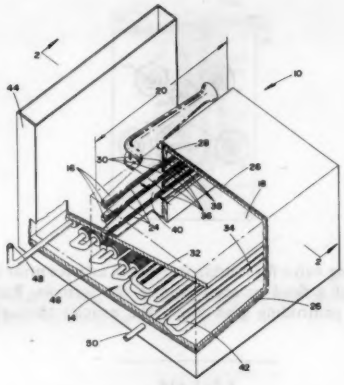
An udder and teat washing and cleansing apparatus characterized by a teat cup dimensioned to receive and wholly enclose each selected teat. When the cup is positioned the beaded mouth thereof accommodates the teat and encompassing udder with requisite nicety for sanitizing, that is, preparatory to the milking step. The bottom of the cup has valving means including an enclosed nipple which aims the mixed solution on the opening of the teat, where infection (mastitis) usually starts. The solution in the cup is in a state of swish-swashing turbulence and is suitably drained. The cup and valving means includes a trippable lever for one-handed use. The source of supply comprises a simple solution and air containing tank having requisite facilities for regulatable control.

3,713,424
LIQUID VAPORIZER

Harold C. Welz, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Oct. 12, 1971, Ser. No. 188,042
Int. Cl. F22b *21/24*
U.S. Cl. 122—356 **7 Claims**

A liquid vaporizer or boiler for vaporizing organic working fluids without substantial decomposition thereof. A combustor of the vaporizer includes a plurality of strip burners for introducing a mixture of primary air-fuel into a baffled combustion chamber; and a strip nozzle adjacent each strip burner for introducing and turbulating secondary air with the primary air-fuel to effect combustion in the combustion chamber that is substantially free of hot-spots. A zig-zag tube bundle down

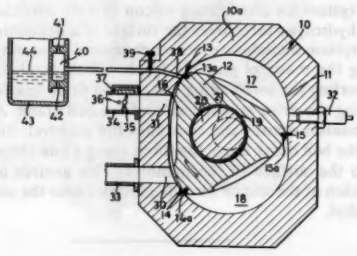


stream from the baffle exchanges heat to vaporize the organic working fluid.

3,713,425
FUEL SUPPLY DEVICE FOR A ROTARY (WANKEL) INTERNAL COMBUSTION-ENGINE

Orazio Satta, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Feb. 8, 1971, Ser. No. 113,248
Claims priority, application Italy, Feb. 12, 1970, 20527 A/70
Int. Cl. F02b *53/04*
U.S. Cl. 123—8.13 **7 Claims**



A rotary internal combustion engine, of the so-called Wankel type in which, in addition to the principal intake port, a secondary intake port is provided in order remedy to the inconveniences which are experienced when such an engine idles. Rate of flow adjustment means for the air and the fuel are also provided.

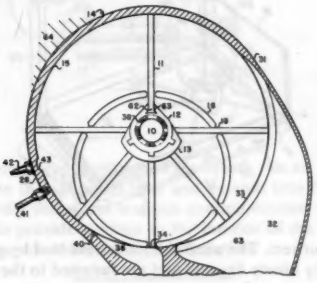
3,713,426
VANED ROTOR ENGINE AND COMPRESSOR

Robert L. Jensen, 906 Junction Hwy., Kerrville, Tex.

Filed Feb. 18, 1971, Ser. No. 116,512
Int. Cl. F02b *53/08*
U.S. Cl. 123—8.29 **9 Claims**

A rotary engine and compressor constructed in elongated configuration around a central shaft to which vanes are rotatably secured. The vanes project through slots in a cylin-

drical rotor mounted off-center on bearings in a casing. The cylindrical rotor is the primary rotating member which drives through gear means the accessory shaft and the power hub. As the rotor and vanes revolve in the casing, the volume between the vanes varies from near zero at the tangent point to a maximum at 180° opposite the tangent point. Selected porting and venting of the casing cause the rotating cylinder and vanes to function as either an engine when fuel and ignition is provided or as a compressor when driven in rotation.



3,713,427

SIMULATOR FOR ELECTRONIC CONTROL CIRCUIT IN A DIESEL ENGINE

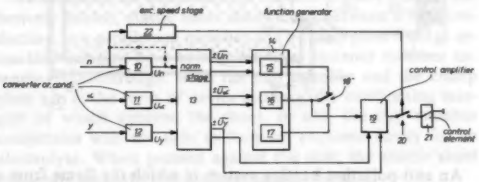
Karl-Heinz Adler, Leonberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 14, 1970, Ser. No. 103,357

Claims priority, application Germany, Dec. 13, 1969, P 19 62 571.9

Int. Cl. F02b *3/00, 33/00*

U.S. Cl. 123—32 EA **33 Claims**



Signals corresponding to motor operating parameters are converted to electrical signals and normalized. Operational amplifier circuits accept normalized signals and have transfer functions simulating characteristic motor curves. Adjustment means are provided for changing the transfer function. Motor has control element which changes fuel injection for operating cycle as a function of output of operational amplifier circuits.

3,713,428

EXHAUST GAS RETURN MEANS FOR INTERNAL COMBINATION ENGINES

Jurgen Sandhagen, Fallersleben, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

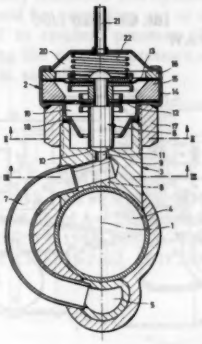
Filed March 10, 1971, Ser. No. 122,888

Claims priority, application Germany, March 11, 1970, P 20 11 464.1

Int. Cl. F02m *7/00*

U.S. Cl. 123—119 A **15 Claims**

An intake system for an internal combustion engine in which intake of air and fuel into the combustion chambers is controlled by a throttle valve. An exhaust gas passage recirculates exhaust gas from the exhaust line back into the combustion chamber together with the incoming air. The flow of exhaust gas through such passage is under the control of a shutoff valve, the operating mechanism for which is controlled in response to differences between the pressure prevailing within the intake system and the pressure in the region of the metering element or throttle valve, to open the shutoff valve only during certain predetermined load conditions of the engine.



3,713,429

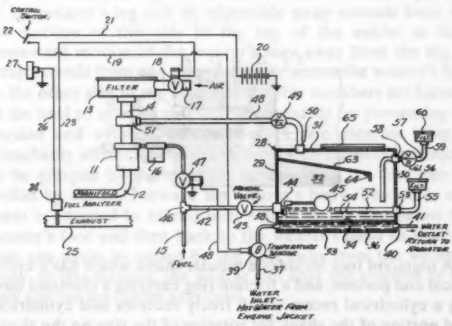
FUEL ECONOMIZER SYSTEM FOR A GASOLINE ENGINE

James R. Dwyre, Ingalls, Kans.

Filed Nov. 5, 1971, Ser. No. 195,929

Int. Cl. F02m *13/04, 17/22*

U.S. Cl. 123—127 **11 Claims**

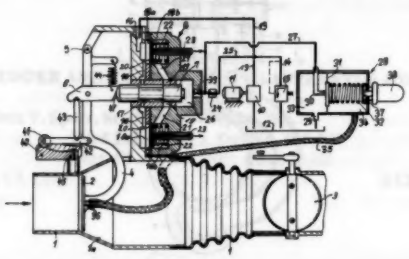


A fuel economizer system for a gasoline engine. A heat sensor in the engine exhaust line controls valves in the normal intake and fuel supply conduits to cause them to close as the engine warms up. A mixture of gasoline vapor and air is supplied to the carburetor from an auxiliary tank supplied with gasoline from the main supply line through a replenishing float valve in the auxiliary tank. The gasoline in the auxiliary tank is heated by a jacket supplied with hot fluid heated by the engine. Air is injected into the gasoline through a multiple-hole terminal nozzle immersed in the gasoline, acting as an agitator, creating a gas-and-air vapor mixture in the upper portion of the auxiliary tank. The air is furnished to the nozzle through a conduit provided with an intake filter.

3,713,430
FUEL INJECTION SYSTEM

Heinrich Knapp, Leonberg, and Reinhard Schwartz, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 16, 1970, Ser. No. 81,341
Claims priority, application Germany, Dec. 1, 1969, P 19 60 148.0
Int. Cl. F02d 1/00
U.S. Cl. 123—139 AW 14 Claims

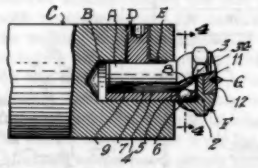


The supply of fuel to an internal combustion engine is controlled by a sensor plate mounted in the suction duct and which deflects in response to air intake rate into a conically flared duct portion. The plate is mounted on a pivoted arm, on which is pivotably mounted a rocker engaging the slider of a fuel measuring distributor valve. Pivotal movement of the arm causes a roller to sense a cam surface and adjust the rocker. The cam surface is movable in response to an engine operating condition to provide different relationships.

3,713,431
DIAMOND TOOL

Chester A. LeBaron, Franklin Lakes, N.J., assignor to Maurice S. Dessau Co., Inc.

Filed Aug. 30, 1971, Ser. No. 175,952
Int. Cl. B28d 5/02
U.S. Cl. 125—39 3 Claims



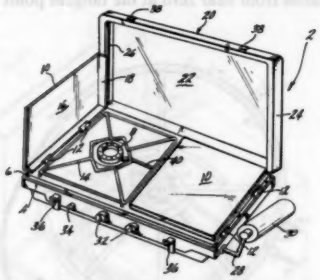
A diamond tool includes a tubular shank which has a cylindrical end portion, and a friction ring carrying a diamond having a cylindrical recess which freely receives said cylindrical end portion of the shank for rotation of the ring on the shank to turn the diamond from time-to-time, and there are radial openings in the shank containing balls which are pressed by a screw pressed pointed rod in the shank into snug but yieldable frictional contact with the wall of said recess to hold the ring in adjusted position.

3,713,432
CAMP STOVE WIND SHIELD LATCH

Carl E. Finley, Sycamore, Ill., assignor to Olin Corporation

Filed Aug. 25, 1971, Ser. No. 174,709
Int. Cl. F24c 5/20
U.S. Cl. 126—38 2 Claims

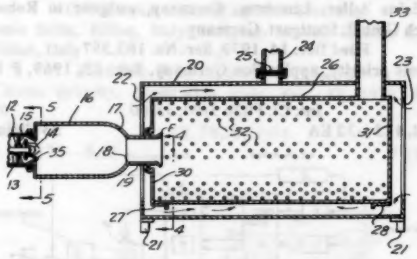
A camp stove of the portable variety having a lid portion hinged to a base portion is disclosed. The base portion carries the burners, a grill and a grease tray for protecting the base against spattering. A pair of wind shields are hinged to opposite ends of the tray and are folded down so as to overlie the grill and burners. The wind shields are erected by pivoting approximately ninety degrees and are fastened to the erected lid portion by spring clips.



3,713,433
ANTI-POLLUTION HEATING SYSTEM

Lewis M. D. Grainger, Glen Allen, Va.

Filed Sept. 21, 1971, Ser. No. 182,456
Int. Cl. F24h 3/00
U.S. Cl. 126—116 R 5 Claims



An anti-pollution heating system in which the flame from a gun type oil burner is fed into a cylindrical chamber somewhat larger in diameter than the outlet of the oil burner. The air feeding the flame is given a swirling motion by a set of stationary vanes in the air passage. The chamber curves inwardly to a reduced diameter outlet to momentarily retard the flow and cause all of the oil to become ignited. The products of combustion pass then into a large chamber where combustion is completed. The large chamber has perforated side walls to permit air to flow therein to provide sufficient oxygen to complete the combustion. A surrounding air chamber conducts air to the heated walls with some of the air flowing into the chamber and the remainder flowing to the air system of a home or other space to be heated. A lip underlies the jet of the oil burner to receive any oil dripping therefrom as the burner is turned off directing the oil into the combustion chamber where it is instantaneously atomized by the heated walls.

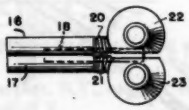
3,713,434
BREATH TESTING DEVICE

Andrew O. Leslie, Jr., Route 1, Box 4, Trout Lake, Wash.

Filed July 2, 1970, Ser. No. 51,937
Int. Cl. A61b 10/00
U.S. Cl. 128—2 C 2 Claims

A breath testing device in the form of a mouthpiece comprising an air inlet tube and an air outlet tube secured together

as a unit and adapted to be held in the mouth of a user with both tubes protruding therefrom. The outer end of the air outlet tube is bent upwardly and divided into nostril-fitting frustoconical members whereby upon inhalation, the breath from the mouth is directed to the olfactory nerves of the user so that



he may perceive the condition of his breath. An air inlet tube is secured to the air outlet tube and extends into the mouth and outwardly therefrom in open communication to the atmosphere to provide ventage to the interior of the mouth to replace air removed therefrom by inhalation.

3,713,435

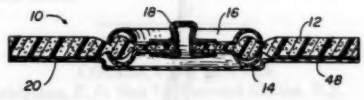
PICKUP ELECTRODE WITH RIGID ELECTROLYTE CUP

Roman Szpur, Dayton, Ohio, assignor to NDM Corporation, Dayton, Ohio

Continuation of Ser. No. 11,208, Feb. 13, 1970. This application June 5, 1972, Ser. No. 259,563

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.06 E **5 Claims**



An electrode for attachment to the skin is made from an adhesively coated, elastic sheet sandwiched between a non-conducting, low profile cup member and a clamp plate fixed in assembled relation by a conductive snap fastener member extending therethrough. Both the cup member and the clamp plate are in the form of cavity washers, the confronting margins of which squeeze the sheet. In use, the cup member cooperates with the skin to form an enclosed cavity for an electrolyte. When pressed against the skin, the elastic sheet resiliently urges the cup member against the skin.

3,713,436

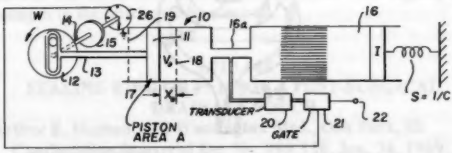
METHOD AND APPARATUS FOR MEASURING MECHANICAL PROPERTIES OF THE RESPIRATORY SYSTEM

Edward V. Hardway, Jr., Houston, Tex., assignor to Spearhead, Inc., Houston, Tex.

Filed Oct. 23, 1970, Ser. No. 83,421

Int. Cl. A61b *5/08*

U.S. Cl. 128—2.08 **19 Claims**



Method and apparatus are disclosed for measuring respiratory resistance and stiffness by forcing a pulsating volume of gas at a known amplitude and frequency into and out of a respiratory system being examined, and sampling the gas pressure at the mouth of the patient in response to the pulsating volume at selected points in time when the rate of flow of the gas and volume displacement are peaked. Apparatus is disclosed for determining when such flow and displacement are peaked, and for converting the sampled pressures into direct readings of respiratory resistance and dynamic stiffness. Also, apparatus is disclosed for cancelling out of the sampled pressures values equal to residual pressure of the respiratory system by averaging the sampled pressure over at least two successive, alternate, sampling times.

3,713,437

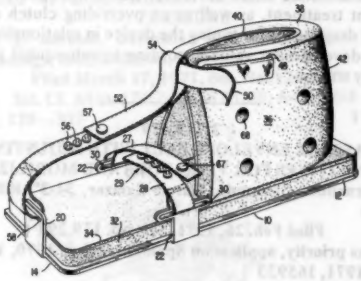
BED SHOE FOR PREVENTING FOOT DROP

Louise Wiedmer, 3909 Floyd Ave., Richmond, Va.

Filed Dec. 19, 1968, Ser. No. 785,240

Int. Cl. A61h *1/02*; **A61f** *5/00*

U.S. Cl. 128—25 R **32 Claims**



The sole of a bed shoe has a perforated plastic lower portion and an upper portion comprised of a polyurethane foam cushion. A polyurethane foam anklet is affixed to the sole so as to substantially surround the wearer's heel and ankle. The top of the anklet is adjustably fastened about the lower portion of the wearer's leg and an adjustable strap extends from the toe portion of the sole to the top of the anklet to limit downward motion of the wearer's toes away from the leg. A strap extends from one side of the sole across the wearer's foot to the other side of the sole; and slidable members are located at the heel so as to be extendable outwardly for preventing inversion and eversion of the foot. A two element strap is detachably affixed to the shoe's heel. One element is adapted to be grasped by the wearer's hand so that the foot can be pulled by the heel toward the wearer's body. The other element is adapted to extend over rollers or the like below the wearer's foot and then back to the wearer's hand so that the foot can again be pulled by the heel away from the wearer's body. In this manner, the wearer can alter the position of the foot and the leg can be exercised.

3,713,438

THERAPEUTIC EXERCISING APPARATUS

Merle E. Knutsen, 2602 N. Vassault St., Tacoma, Wash.

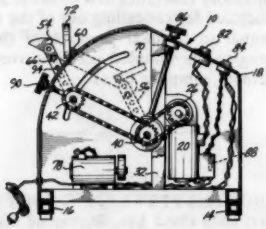
Filed May 6, 1971, Ser. No. 140,812

Int. Cl. A61h *1/02*

U.S. Cl. 128—25 R **8 Claims**

An electromechanical device for exercising the lower limbs of a person from hips to toes. The device is provided with a pair of pedals for securing each foot from toe to heel, and whereby the foot stays on a plane which moves constantly parallel to itself during vertical rotation of the pedal. Each

pedal has two spaced-apart pivot bearing points connected to a set of parallel arms, respectively. Each arm is mounted to an axle which is interconnected for rotation to a motor. In addition, each parallel set of arms is provided with adjusting means for varying independently each pedal position. A vibrator



means is mounted to the device for added therapeutic muscle and joint treatment, as well as an overriding clutch and adjustable drag means for tuning the device in relationship to the muscle development value according to subsequent physical recovery stages.

3,713,439

MASSAGE ENVELOPE BELT WITH ADJUSTING DISPOSITIVES FOR VIBRATORS AND MOBILIZERS

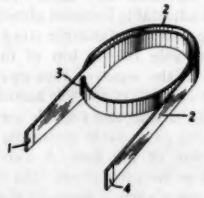
Jose Fernandez Cabezudo, Garcia Salazar, 34-3°, Bilbao 12, Spain

Filed Feb. 26, 1971, Ser. No. 119,293

Claims priority, application Spain, March 2, 1970, 156399; Feb. 9, 1971, 165933

Int. Cl. A61h *11/00*

U.S. Cl. 128—63 **3 Claims**



Improvements in massage jacket belts for vibrators and mobilizers are disclosed. The new and useful massage jacket belts disclosed in the present invention comprise a transverse opening in the belt which is smaller in height than that corresponding to the belt in the previous location.

3,713,440

FILTRATION SYSTEM

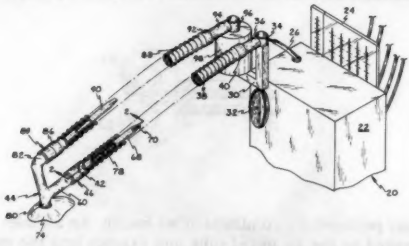
Paul S. Nicholes, 330 South 1300 East, Salt Lake City, Utah

Filed Jan. 18, 1971, Ser. No. 107,172

Int. Cl. A62b *7/10*

U.S. Cl. 128—188 **6 Claims**

A filtration system, including apparatus and method for conventional anesthesia or respiratory therapy apparatus, the filtration system having tubular filters formed of fibrous material interposed in both the inspiratory and expiratory tubes. If either of the filters is directed counter to the flow of gas in the inspiratory or expiratory tubes, an internal support member may be used to maintain the inflated configuration of the filter. Attachment structure is provided to couple the filters to the anesthesia apparatus and to accommodate aseptic removal of the filters from the anesthesia apparatus.



3,713,441

METHOD OF USING AN ARTERY-VEIN SHUNT APPLIQUE

George I. Thomas, Seattle, Wash., assignor to The Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 45,331, June 11, 1970, abandoned. This application Oct. 22, 1970, Ser. No. 82,927

Int. Cl. A61m *5/00, 25/00*

U.S. Cl. 128—214 R **2 Claims**

An artery-vein shunt having graft material applique secured at its ends is permanently implanted by suturing the applique to the host blood vessels. The shunt is particularly intended for use in hemodialysis.

3,713,442

SPLIT NEEDLE ASSEMBLY FOR CATHETER TUBE

Harry J. Walter, 940 West 100th Place, Denver, Colo.

Filed Sept. 8, 1970, Ser. No. 70,001

Int. Cl. A61m *5/00*

U.S. Cl. 128—214.4 **8 Claims**

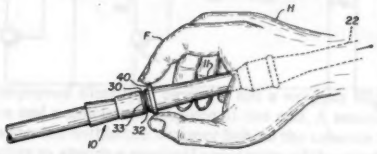
A split needle assembly for the placement of a catheter tube in a vein includes a sectional needle which is split longitudinally into smaller and larger needle sections having complementary edges. A removable retainer at the base of the needle

sections holds them together during needle insertion and withdrawal and provides a grip for the user. Once the needle is inserted the catheter tube is advanced through the needle into the vein and secured in place, after which the needle is withdrawn, the retainer removed, and the needle sections separated for complete removal from the tube.

3,713,443
SUCTION CONTROL HANDLE FOR SURGICAL ASPIRATOR

Ira J. Fertik, Bay Terrace, N.Y., assignor to Vernitron Corporation, Great Neck, N.Y.

Filed Dec. 9, 1970, Ser. No. 96,418
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 **8 Claims**

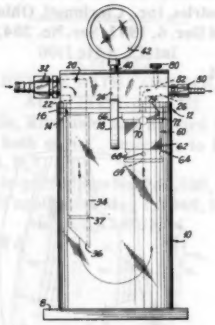


A control handle for a surgical aspirator comprising a rigid tubular body having an axial passage. An external circumferential groove is formed in the body with a plurality of radial holes connecting the bottom of the groove with the passage. An elastic ring seats in the groove and is movable for controlling the magnitude of suction in said passage by adjustably clearing the holes.

3,713,444
COLLECTION BOTTLE

Henry Bridgman, P. O. Box 71, Convent Station, N.J.

Filed Aug. 13, 1970, Ser. No. 63,480
Int. Cl. A61f *5/44*
U.S. Cl. 128—275 **4 Claims**



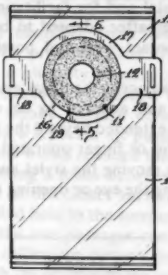
A collection bottle adapted for use in uterine aspiration systems. The bottle reduces the production of foam and splash, and prevents any foam, liquids, and solid material from passing from the collection bottle to a source of vacuum. Should the collection bottle become filled with liquid, the vacuum in the bottle will be stopped.

3,713,445
SEALING RING OR PAD FOR A POST-SURGICAL DRAINAGE POUCH

Arthur E. Marsan, 640 Washington Blvd., Oak Park, Ill.

Continuation-in-part of Ser. No. 795,138, Jan. 24, 1969, abandoned. This application Jan. 27, 1971, Ser. No. 110,234
Int. Cl. A61f *5/44*
U.S. Cl. 128—283 **2 Claims**

The invention is characterized by the provision of a sealing ring or pad for use with a post-surgical drainage pouch such as in colostomy and ileostomy appliances, comprising a unitary structure having open cell foam filled with gelatinous sealing

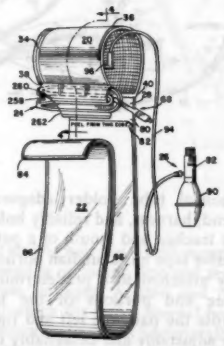


material whereby to provide a sealing ring or pad having effective sealing properties over a longer period of use.

3,713,446
SELF-APPLIED PNEUMATICALLY ACTUATED PRESSURE

Stanley J. Sarnoff, Bethesda, Md., assignor to Survival Technology, Inc., Bethesda, Md.

Filed March 17, 1971, Ser. No. 125,207
Int. Cl. A61b *17/12*; B65d *63/00*; A44c *5/18*
U.S. Cl. 128—327 **11 Claims**

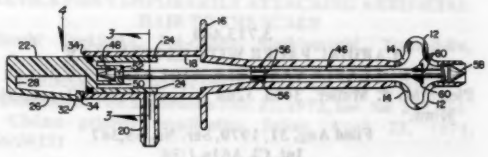


A self-applied pneumatically actuated pressure bandage adaptable for use as a compression bandage, tourniquet or cuff wherein the pressure is applied by a manually operated pump, and is controlled by an adjustable regulator.

3,713,447
SUPRAPUBIC SHUNT

Edwin Lloyd Adair, 5985 South Crocher Street, Littleton, Colo.

Filed Aug. 16, 1971, Ser. No. 171,884
Int. Cl. A61b *17/34*; A61m *25/00*
U.S. Cl. 128—347 **10 Claims**



Retention catheter of the expandable wing type, of particular utility as a suprapubic shunt, adapted to be inserted into

the bladder through an incision in the lower abdominal wall, characterized by:

a. a trochar tube having a slidable stylet therein with a pointed inner or distal end for facilitating insertion through the incision and thereafter adapted to be retracted into the tube to prevent contact with and possible damage to the bladder,

b. resilient wings adjacent the distal end, normally urged to expanded position and adapted to be collapsed when the pointed stylet end is extended beyond the trochar tube,

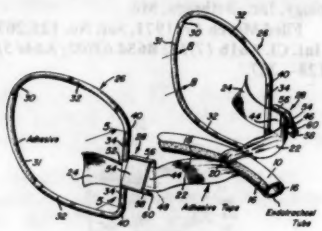
c. a slidable button or finger operated member carried by the trochar tube for moving the stylet and also for rotating a valve, communicating the eye or opening in the distal end with a cannula or tube.

3,713,448

ENDOTRACHEAL TUBE HOLDER

Janice J. Arrott, 7625 Mountain Road, N.E., Albuquerque, N. Mex.

Filed Feb. 16, 1971, Ser. No. 115,438
Int. Cl. A61m *25/02*
U.S. Cl. 128—351 **8 Claims**



An endotracheal tube holder adapted to supportively balance, suspend, harness, and reliably hold the tube in given position in the trachea and mouth of a patient. A prescribed length of adhesive tape has a median portion wrapped around and adhesively attached to a predetermined portion of the tube. The free end portions of the tape are tautened lengthwise across the patient's left and right cheeks, respectively, and are adjustably and detachably fastened to clamps. These clamps are oriented with like loops, more particularly, a pair of ear encircling adapters. These adapters are made from plastic tubing and are applied to the ears of the patient prior to intubation, if desired. The rearward curvate end portion of each adapter is lodged and seated in the deepest groove behind the cartilage directly above the earlobe and adhesively held in place. The adapter proper encircles the ear, resides flatwise against the patient's cheek and locates a complemental clamp in the place and position desired. Accordingly, the clamped and harnessed tape functions to properly suspend and prevent displacement of the tube.

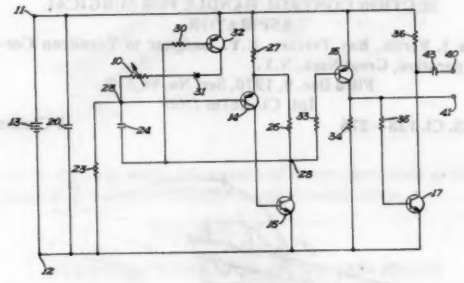
3,713,449

CARDIAC PACER WITH EXTERNALLY CONTROLLABLE VARIABLE WIDTH OUTPUT PULSE

Pieter M. J. Mulier, 3408 32nd Avenue, N.E., Minneapolis, Minn.

Filed Aug. 31, 1970, Ser. No. 68,347
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **10 Claims**

An implantable cardiac pacer having electrode means adapted to be connected to the hart and electrical circuitry connected to the electrodes for providing hart stimulation pulses. The electrical circuitry includes a pulse generator for providing a timed pulse and means for selectively varying the pulse width. The electrical circuitry also includes means for providing a substantially constant voltage or current output



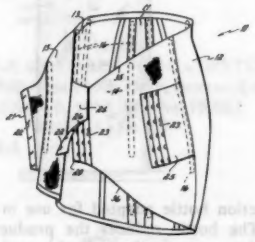
pulse, regardless of change in load impedance. The circuitry is encapsulated in a substance substantially inert to body fluids and tissue, and the means for varying the pulse width is preferably controlled by a nonmechanical contact with a device external to the encapsulating substance.

3,713,450

POST-OPERATIVE GARMENT

Marguerite R. Williams, Trumbull, Conn., assignor to Surgical Appliance Industries, Inc., Cincinnati, Ohio

Filed Dec. 6, 1971, Ser. No. 204,974
Int. Cl. A41c *1/00*
U.S. Cl. 128—564 **11 Claims**

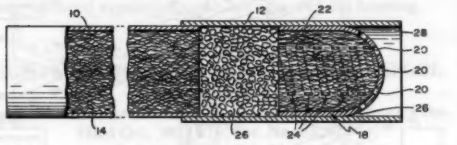


A post-operative garment includes a back panel of sufficient vertical dimension to cover the rear portion of the wearer's trunk, as well as the wearer's lower back region; partially overlapping tapered front panels which cover a portion of the wearer's abdomen; and opposite elastic side panels which interconnect the back and front. The upper and lower tapered edges of the overlapping front panels cross at respective upper and lower points, the distance between the cross points being substantially less than the vertical dimension of the back panel. An alternate embodiment includes a similar garment provided with legs and an additional highly elastic front panel which underlies the tapered, overlapping front panels.

3,713,451
ARTICLE FOR SMOKING

Louis Bromberg, 99 Walnut Hill Road, Newton Highlands, Mass.

Filed Sept. 11, 1970, Ser. No. 71,400
Int. Cl. A24d 01/04
U.S. Cl. 131—9 3 Claims

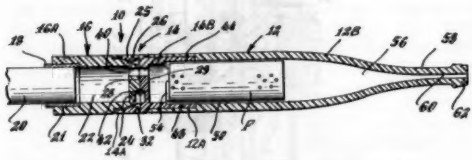


An improved filter-type cigarette has a wrapper filled with tobacco and a special mouthpiece at one end. A non-tobacco filter is located within the wrapper behind the tobacco fill and is effective to absorb a maximal percentage of the combustion products of the tobacco. A non-absorbent, non-porous capsule is retained within the mouthpiece behind the filter and contains a small fill of aromatic tobacco. The capsule is perforated. In use, the filter entraps most of the undesirable constituents of the cigarette smoke but permits some hot smoke to pass through the filter and into and through the capsule. The hot smoke releases the volatile flavoring within the capsule. The process is enhanced by locating a thread or small ribbon of heat conductive material, such as aluminum, within the capsule to enhance heat and volatilization. Additionally, the flow passage through the cigarette is enhanced by providing a seal above the mating surface of the capsule in the internal surface of the mouth piece. The outer surface of the capsule also is roughened to preclude separation of the capsule from the mouthpiece.

3,713,452
SMOKING DEVICE WITH CONTROLLABLE AIR ADMITTING MEANS

Anthony N. D'Elia, Riverdale, and Edward M. Stolarz, Yorktown Heights, both of N.Y., assignors to Delcron Products, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 744,500, July 12, 1968, abandoned. This application May 1, 1969, Ser. No. 825,110
Int. Cl. A24f 05/04
U.S. Cl. 131—198 A 2 Claims

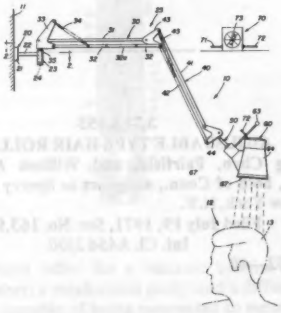


This invention provides a smoking device arranged to dilute the smoke from cigarettes, cigars, and the like. The smoking device includes a rotating index section, a center section, and a mouthpiece. The rotating index section has formed at one end a smoking chamber which is adapted to receive smoke from the cigarette, and on the other end has a reduced portion rotatably mounted in a socket formed by a peripheral wall and a transverse wall of the center section at one end thereof. The remainder of the center section, being a tubular portion, is slidably mounted in a recess bounded by a peripheral wall at one end of the mouthpiece which has formed at its other end a smoke withdrawal chamber from which a smoker may withdraw the smoke products. The transverse wall of the center section has a plurality of pairs of orifices of varying sizes. Within the reduced end portion of the rotating index section there is a smoke passage communicating with the smoke chamber and a separate air passage formed as a relatively large blind hole with a reduced thickness at the reduced end of the hole forming a space between the end portion and the peripheral wall of the center section to provide a direct passage from the blind hole to the surrounding air. By rotating the index section, the two passages can be aligned with any one of the pairs of orifices to meter a predetermined ratio of air to smoke through the orifices to the withdrawal chamber of the mouthpiece.

3,713,453
APPARATUS FOR STYLING HAIR

James S. Chiaro, and Susan C. Chiaro, both of Chicago, Ill., assignors to said James S. Chiaro, by said Susan Chiaro

Filed April 5, 1971, Ser. No. 131,107
Int. Cl. A45d 4/18
U.S. Cl. 132—9 1 Claim



An apparatus for styling hair has a wall-mounted base and a equipoised arm assembly including first and second interconnected parallelogram linkages. At one end of the arm assembly, is a journal which fits into a journal bore in the base, to enable the arm assembly to swivel horizontally. A lamp-supporting device which carries a lamp head is disposed on the other end of the arm assembly and is movable in a variety of directions. A bulb in the socket of the lamp head is capable of emitting at least 300 watts, the precise value of which is controlled by a variable power source. A handle is attached to the lamp head to enable a user selectively to move the lamp head as needed. The apparatus is used in the styling of hair which has first been washed and then partially dried. The lamp is used successively to heat limited areas of the hair for drying the same and at the same time cutting and combing the hair in each particular area in accordance with its natural growth pattern.

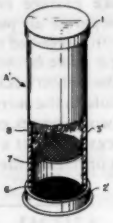
3,713,454
DEVICE FOR TEMPORARILY ATTACHING ARTIFICIAL HAIR TO THE SCALP

Hitoshi Tsukisaka, 7,4-chome, Ueshiomachi, Tennoji-ku, Osaka, Japan

Continuation-in-part of Ser. No. 844,988, July 25, 1969, abandoned. This application Feb. 22, 1972, Ser. No. 227,854
Claims priority, application Japan, April 22, 1971, 46/26271
Int. Cl. A45d 1/00
U.S. Cl. 132—9 10 Claims

An elongated hollow container has open opposite ends. At least one shelf-like member having a network of apertures

therein defining a mesh is transversely positioned within the elongated hollow container. The size of the apertures of the members increases from bottom to top when more than one member is used. Artificial hairs of a substantially uniform



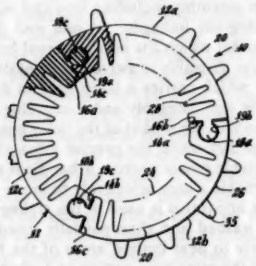
length are supplied to the container through the upper end thereof. This end is then closed by a lid, and the device is shaken up and down, whereby the hairs are fed through the mesh in a uniform and upright manner.

3,713,455

ADJUSTABLE TYPE HAIR ROLLERS

Nai-Keung Chen, Fairfield, and William A. Omohundro, Weston, both of Conn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed July 19, 1971, Ser. No. 163,933
Int. Cl. A45d *2/00*
U.S. Cl. 132—40 **16 Claims**



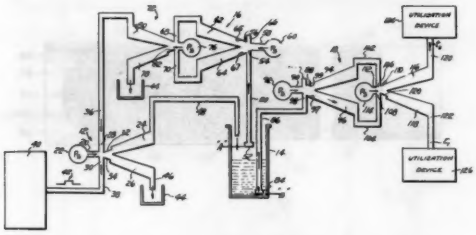
A segmentally constructed cylindrically-shaped hair roller is described, which includes a plurality of flexible, resilient, arcuately-shaped segments. Each of the segments have longitudinally extending side edges respectively provided with an interlocking surface. Each of the side edges of each of the segments may thus be interlocked with one of the side edges of the next adjacent segment. In the process of doing so the ends of each of the interlocking surfaces of each segment are aligned with the corresponding ends of the interlocking surfaces of at least one of the other segments, and longitudinally slidably engaged. For example, a two segment roller may then be constructed by aligning each of the interlocking surfaces of one segment with the corresponding interlocking surfaces of another segment, and longitudinally slidably engaging the aligned surfaces.

3,713,456

FLUIDIC TIMER

Daniel D. Barnard, Birmingham, Mich., assignor to The Bendix Corporation

Filed Dec. 21, 1970, Ser. No. 99,801
Int. Cl. F15c *1/12*
U.S. Cl. 137—81.5 **11 Claims**



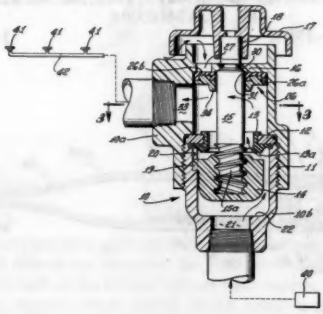
An arrangement for producing a fluid output signal of a specified duration, for use in fluidic logic and control circuits, comprising a liquid fill tank, a fill circuit which upon initiation of the circuit function is arranged to direct a predetermined volume of liquid into the tank by a continued activation of the circuit until the liquid in the tank reaches a specified level and a tank emptying and signal output circuit which removes liquid from the tank and produces the output signals as long as the level of liquid in the tank is above a second lower level, by means of a sensing tube having its outlet located at the second level which controls a pair of jet amplifiers so as to produce the output signal whenever the sensing tube is aspirating liquid from the tank and discontinue the output signal when the tube begins to aspirate air. The rate of aspiration of the sensing tube liquid and the volume of fluid supplied by the fill circuit controls the duration of the output signal.

3,713,457

COMBINATION ANTI-SIPHON AND SHUT-OFF PLASTIC VALVE

Andrew M. McInnis, 3601 Rancho Del Monica, Covina, Calif., and Robert A. Nielsen, 1026 Cynthia Ave., Pasadena, Calif.

Filed Dec. 28, 1970, Ser. No. 101,837
Int. Cl. F16k *45/00*
U.S. Cl. 137—218 **3 Claims**



A valve of substantial plastic construction comprises:

a. a molded plastic chamber and an annular main seat therein, there being a chamber outlet,

b. a stem projecting through the seat with clearance therefrom, the stem carried by the chamber at one side of the seat,

c. an externally accessible handle operatively connected with the stem to rotate same, and

d. a stopper having thread connection with the stem and operable to engage and disengage the seat at the opposite side thereof and in response to stem rotation, and

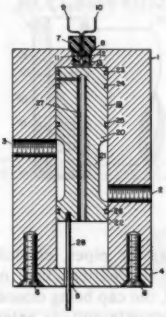
e. the chamber having a liquid pressure inlet to communicate said pressure to the stopper for transmitting pressure loading to the seat when stem is rotated to engage the stopper against the seat, whereby the stopper will remain closed against the seat irrespective of liquid pressure or temperature change induced expansion and contraction of the housing.

3,713,458

HIGH-PRESSURE, EXPLOSIVELY-ACTUATED SPOOL VALVE

John T. M. Lee, Phoenixville, Pa., assignor to ICI America Inc.

Filed Oct. 30, 1970, Ser. No. 85,477
Int. Cl. F16k *3/26, 31/00*
U.S. Cl. 137—312 10 Claims



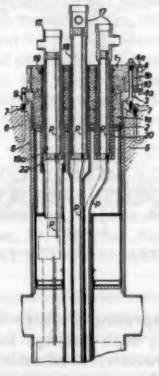
An explosively-actuated, normally-opened spool valve. The valve has a duct through the spool or the valve casing which prevents movement of the spool due to leakage of a high-pressure fluid flowing through the valve.

3,713,459

REMOVABLE COVERS FOR APERTURES IN PRESSURE VESSELS

Robert Faulds McIver, Sandford, Warehan, Dorset, and Frederick Albert Leslie Marchbank, Poole, Dorset, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed May 26, 1969, Ser. No. 827,514
Claims priority, application Great Britain, June 10, 1968, 27,580/68
Int. Cl. E04h *7/20*
U.S. Cl. 137—357 3 Claims



A prestressed concrete pressure vessel has penetrations in the wall which should be capable of being closed by removable closure members which offer the same security against fracture as the vessel itself. The invention provides such a closure member which comprises a prestressed concrete portion and bonded thereto a steel portion through which the releasable fastening of the closure member to the pressure vessel is made.

3,713,460

SINGLE CONTROL VALVE FOR VACUUM SYSTEM

Patrick Picker, Sherbrooke, Canada, assignor to Universite De Sherbrooke, Sherbrooke, Quebec, Canada

Filed Feb. 16, 1971, Ser. No. 115,544
Int. Cl. F16k *11/00*
U.S. Cl. 137—566 9 Claims

A single control valve for a vacuum system having an evacuable chamber, a mechanical pump and a diffusion pump all of which are capable of being connected to means for supplying air. This valve comprises a valve body and an enclosure inside the valve body. The enclosure is formed of a first, a second, a third and a fourth chamber, all these chambers being in consecutive order in the continuation of one another and capable of communication with one another. A first duct connects the first chamber to the diffusion pump and a second duct connects the first chamber to the chamber to be evacuated. A third duct connects the second chamber to the mechanical pump, a fourth duct connects the third chamber to the diffusion pump and a fifth duct connects the fourth chamber to the entry of air. Means are provided to create a vacuum in the chamber to be evacuated in a four step cycle. In the first step, the diffusion pump is isolated from the chamber to be evacuated by blocking the first duct and closing all communication between the second and the third chamber while allowing the mechanical pump to communicate with the chamber to be evacuated via the second and first chambers and the respective ducts. In the second step, the mechanical pump is isolated from the chamber to be evacuated and the diffusion pump is kept isolated in order that only the first chamber is in communication with the chamber to be evacuated. In the third step, the chamber to be evacuated is kept isolated from the mechanical pup and from the diffusion pump and the mechanical pump is allowed to pump in the diffusion pump by opening the communication between the second chamber, the third chamber, the fourth duct and the diffusion pump. Finally, in the fourth step the operating conditions of the third step are maintained except that the first duct is opened to prevent any entry of air via the fifth duct with the result that the diffusion pump communicates with the chamber to be evacuated via the first chamber thus contributing to establish a high vacuum in the system to be evacuated.

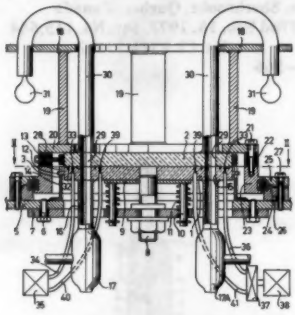
Control means are provided to carry out the four steps aforementioned.

3,713,461

SEAL ROTARY DISTRIBUTION VALVE

Victor Rosallie Notelteirs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed March 23, 1971, Ser. No. 127,189
Claims priority, application Netherlands, April 8, 1970, 7005063
Int. Cl. F16k 5/22, 11/02
U.S. Cl. 137—625.18 5 Claims



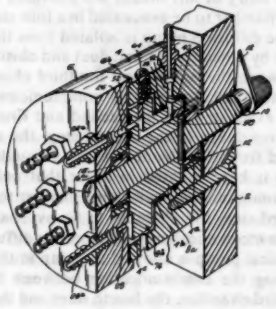
A distribution valve for a device for evacuating and filling a vessel with gas. This valve comprises a rotatable part and a stationary part; the rotatable part having a number of ports which are connected to the vessels to be processed and the stationary part having a corresponding number of ports which are connected to the evacuating and filling apparatus. In order to prevent the entrance of air into the ports, a number of concentric circumferential grooves are provided in the confronting surfaces between the circumference and the center of the rotating and stationary parts. These grooves are maintained under a slight positive pressure by an inert gas supply.

3,713,462

APPARATUS FOR CONTROLLING FLOW OF PRESSURIZED FLUIDS

Joseph J. Bushee, 36 Purvis St., Watertown, Mass.

Filed Dec. 30, 1970, Ser. No. 102,859
Int. Cl. F16k 11/02
U.S. Cl. 137—625.21 10 Claims



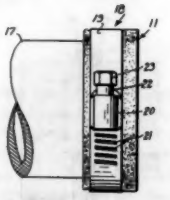
A valve housing having a fluid inlet is formed internally with an annular spaced defined by space sealing members. Pressurized fluid is introduced through the inlet into the annular space. Portions of the pressurized fluid are continuously confined in a rotor conduit member which sealably communicated with the annular space throughout approximately a 360° path of travel of the movable conduit. The rotor conduit is moved through successive register positions in which pressurized fluid is conducted from the annular space through outlets in a fluid outlet head attached at one side of the valve housing.

3,713,463

CLOSURE MEMBER FOR PIPES AND THE LIKE

James W. Bywater, Rowland Heights, Calif., assignor to Lucille M. Bywater, Pasadena, Calif., part interest to each

Filed Dec. 24, 1970, Ser. No. 101,248
Int. Cl. F16l 55/10
U.S. Cl. 138—89 2 Claims



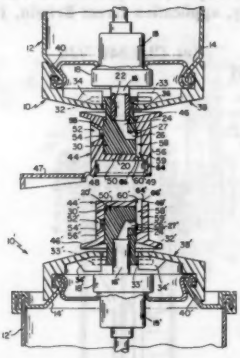
A closure member for pipes, conduits, etc. is disclosed which comprises a cylindrical cap of rubber or other elastomeric material, the cap being closed at one end and having inwardly and circumferentially extending ridges around the inner periphery of its skirt to engage the outer periphery of the pipe. A clamp surrounds the skirt and is adapted to constrict the skirt against the pipe to seal the latter.

3,713,464

PRESSURIZED DISPENSING PACKAGE SYSTEM

Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Boston, Mass.

Filed March 3, 1971, Ser. No. 120,494
Int. Cl. B65b 3/04, 31/00; B67c 3/00
U.S. Cl. 141—20 16 Claims



A pressurized dispensing package system includes two dispensing packages, each package including a projecting discharge passage structure. An actuator assembly maintained on one of the discharge passage structures includes an inner member having a cylindrical surface and an outer member

having a mating inner cylindrical surface. The outer member also defines a discharge conduit and a refilling conduit, the refilling conduit extending in a direction generally parallel to the axis of the discharge passage structure and including a configured valving surface adapted to mate with a correspondingly configured complementary surface of the other package. The outer structure is rotatable on the inner structure between a dispensing position in which the discharge conduit is aligned with a transfer passage in the inner structure and a refilling position in which the refilling conduit is aligned with the transfer passage.

3,713,465

DEVICE FOR FILLING FLOWER POTS WITH EARTH

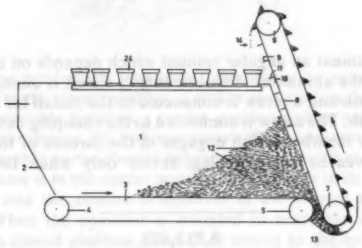
Arnoldus Hendricus van Nobelen, 59 Kerkstraat, Noordwijkerhout, Netherlands

Filed Feb. 16, 1971, Ser. No. 115,425

Claims priority, application Netherlands, Feb. 16, 1970, 7002169

Int. Cl. B65b *43/52*

U.S. Cl. 141—134 **3 Claims**



A device for filling pots such as flower pots with earth or the like, said device having a vessel for receiving an earth supply, a conveyor for moving a number of pots towards and from the location where the filling occurs and means for raising the earth from the vessel to above the plane of the pot-conveyor, in which an upright side of the supply vessel is formed by a side of a vertically extending endless conveyor enclosing an acute angle with respect to the bottom plane of the vessel. The vertically extending conveyor has step means capable of receiving earth from the vessel. The bottom of the vessel is the upper side of a belt conveyor and a channel is provided at the point where the conveyors meet. The step means of the upright conveyor are capable of moving along the wall of the channel. The conveyor forming the top of the supply-vessel consists of a number of chains or the like and between the chains are right angle shaped plate strips, one leg of each strip being parallel to the conveyor, the other leg perpendicular thereto. The conveyor for the pots consists of an endless chain led over rollers, said chain being formed with dogs and of a guiding path within the reach of the dogs, the distance between two successive dogs being smaller than the width of the conveying elements on the upright conveyor.

3,713,466

CHAIN SAW BRUSH CUTTING ACCESSORY

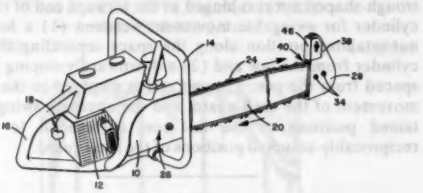
Jon A. Lund, 65 Stone Street, Augusta, Maine

Filed Dec. 29, 1971, Ser. No. 213,452

Int. Cl. B27b *17/02*; A01g *3/08*

U.S. Cl. 83—790 **10 Claims**

A brush cutting accessory device removably mounted on a power chain saw to facilitate the cutting of low lying brush and small whippy limbs. The accessory device includes a hollow tip enclosure mounted on the free outer end of the chain guide bar to enclose and shield the outer end of the cutting chain. The accessory device also includes a brush guide which extends upwardly from the hollow tip enclosure. The brush guide is shaped and positioned to support and to guide brush



and limbs into shearing engagement with the upper outward run of the cutting chain in the area where the chain enters the hollow tip enclosure.

3,713,467

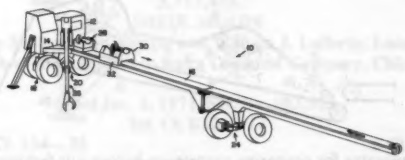
DELIMBING BLADE

Victor Charles Pierrot, III, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed April 26, 1971, Ser. No. 137,153

Int. Cl. A01g *23/02*

U.S. Cl. 144—2 Z **2 Claims**



Delimbing blades are adapted to be driven lengthwise of a tree stem for removing the limbs from the stem by impact. The blades are curved to fit closely to a tree stem and the trailing portions of the blades are offset in a direction which disposes them farther outwardly from a stem being delimbed than the leading portions of the blades. The offsets define reliefs which permit the leading portions of the blades to return to cutting positions next to the stem while the blades are passing over swells at the bases of limbs which have just been cut.

3,713,468

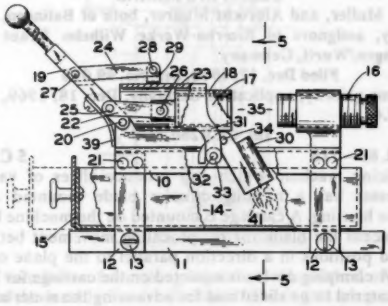
HAND NUTCRACKER WITH SHELL GUARD AND NUT UNLOADER

Carroll H. Walsh, 2002 Cherry Street, Pine Bluff, Ark.

Filed May 28, 1971, Ser. No. 147,920

Int. Cl. A47j *43/26*

U.S. Cl. 99—580 **7 Claims**



A hand nutcracker having a hollow, horizontally extending guide cylinder containing a piston reciprocably movable with respect to a spaced stationary jaw for cracking and releasing a

nut placed therebetween in response to predetermined movements of a handle associated with the piston and a hollow cylindrical shell guard moving with the piston, includes a trough-shaped nut rest hinged to the forward end of the guide cylinder for swingable movement between (1) a horizontal nut-retaining position along the space separating the guide cylinder from the jaw and (2) a downwardly sloping position spaced from the jaw. The nut rest is disposed in the path of movement of the shell guard, and the alternate swingably-attained positions of the nut rest correspond to definite reciprocably-attached positions of the shell guard.

3,713,469

APPARATUS FOR PREPARING SUGAR CANE

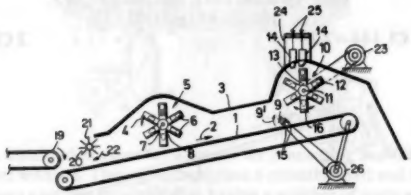
Walter Dietzel, Im Roehrfeld, Braunschweig, Germany, assignor to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed Dec. 10, 1970, Ser. No. 96,909

Claims priority, application Germany, Dec. 20, 1969, P 19 63 944.2

Int. Cl. B02c *23/02*

U.S. Cl. 83—523 **7 Claims**



Apparatus for preparing sugar cane before it is fed to a diffusion plant of the type including a conveyor belt, means for supplying sugar cane to the belt, a device for spreading out the layer of cane on the belt to make it even and a preliminary rotary comminuting cutter mounted above the conveyor belt for cutting up the cane on the belt is provided with a second rotary comminuting cutter mounted above the belt in a position downstream, in the direction of conveyance, of the preliminary cutter and a rotary cane lifting drum which is mounted just upstream of the second rotary cutter and rotates about an axis transverse to the conveyor belt to feed the partly comminuted cane to the second rotary cutter which cuts up the cane into a finely divided state ready for feeding to the diffusion plant.

3,713,470

SLICING MACHINE WITH MATERIAL ADVANCING CLAMPING MEANS

Ernest Muller, and Albrecht Maurer, both of Balingen, Germany, assignors to Bizerba-Werke Wilhelm Kraut KG, Balingen/Wurtt, Germany

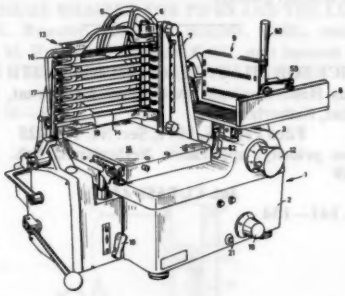
Filed Dec. 17, 1970, Ser. No. 99,018

Claims priority, application Germany, Dec. 18, 1969, P 19 63 352.4

Int. Cl. B26d *5/20*

U.S. Cl. 83—718 **5 Claims**

A slicing machine which can produce slices of varying thicknesses has a rotating circular blade mounted on a machine housing. A carriage is mounted on the machine housing adjacent the blade for reciprocating movement between two end positions in a direction parallel to the plane of the blade. A clamping device is mounted on the carriage for holding a material to be sliced and for advancing the material in a direction transverse of the path of movement of the carriage and toward the plane of the blade a distance which is a function of a predetermined slice thickness. The clamping means is advanced by a device having a continuously variable abutment attached to the machine housing. A rack is mounted on the carriage means for relative movement with respect thereto and is arranged to contact the abutment and be restrained thereby from movement with the carriage as the carriage moves to one of its end positions. A pinion rotatably mounted in the housing engages the rack for rotation thereby as the carriage moves relative to the rack when the rack is restrained by



the abutment an angular amount which depends on the position of the abutment. An overrunning clutch is connected to the pinion and a screw is connected to the clutch for rotation therewith. The screw is connected to the clamping device by a follower member which engages in the threads of the screw and advances the clamping device only when the screw rotates.

3,713,471

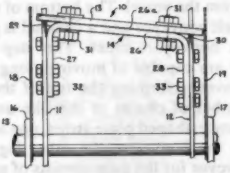
KNIFE BRACKET FOR FORAGE HARVESTER CUTTERHEAD

Loren G. Sadler, Stevens, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 26, 1970, Ser. No. 66,931

Int. Cl. A01d *55/18*

U.S. Cl. 83—523 **2 Claims**



Single piece U-shaped brackets are mounted between the side plates of a forage harvester rotary cutterhead in circumferentially and evenly spaced relation to individually support the knives at axial and clearance angles for chopping cut crops in a cooperating scissor action with the stationary shear bar.

3,713,472

VEHICLE CLOSURE SYSTEM

James H. Dozois, Harper Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

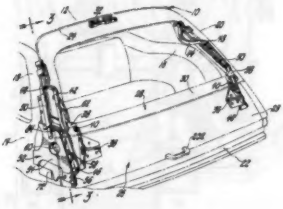
Filed Nov. 17, 1971, Ser. No. 199,660

Int. Cl. E05f *15/12*

U.S. Cl. 160—189 **2 Claims**

A station wagon tailgate type vehicle closure system operable in a randomly interchangeable manner in either one of a

power mode and a manual mode, the system including a closure, an operator movable from a center position in opening and closing directions, a pin and slot connection between the closure and the operator effecting movement of the closure in the power mode during movement of the operator in either direction away from the center position while permitting lost motion between the closure and the operator during movement of the operator back to the center position, the lost motion also permitting movement of the closure in the manual mode when the operator is in the center position, a manual switch for energizing a motor adapted to drive the operator in either direction away from the center position, a reversing and stopping circuit responsive to deactuation of the manual



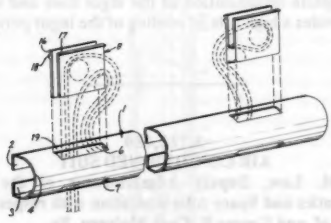
switch for temporarily energizing the motor to return the operator to the center position, a striker mounted on the vehicle and movable between a center position and an extended position synchronously with movement of the operator, and a latch assembly on the closure engageable on the striker. When the operator is in the center position the striker is in its center position and the closure is movable in the normal manual mode. When the operator is actuated to move the closure toward a closed position the striker moves to the extended position for engagement with the latch assembly whereafter the striker during movement back to the center position pulls the closure to a fully closed position synchronously with movement of the operator back to its center position.

3,713,473

CORD GUIDING DEVICE FOR A TRAVERSE ROD

James A. Ford, Sturgis, Mich., assignor to Kirsch Company, Sturgis, Mich.

Filed Aug. 12, 1970, Ser. No. 63,165
Int. Cl. A47h *5/032*
U.S. Cl. 160—345 **12 Claims**



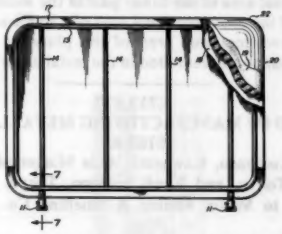
A molded cord guiding device for a traverse rod in which the traverse rod has one opening in either the top or bottom thereof and in a preferred embodiment it has aligned openings in both the top and bottom thereof. The molded cord guiding device is inserted into at least one of said openings, and may extend through both the top and bottom openings, to guide cords as desired, either from within the traverse rod to the exterior thereof and downwardly therefrom or to reverse the direction of a cord contained wholly within the traverse rod.

3,713,474

PORTABLE WALL PARTITION

James V. Orlando, 4718 North 36th Street, Phoenix, Ariz.

Filed April 26, 1971, Ser. No. 137,221
Int. Cl. E04b *2/74*
U.S. Cl. 160—351 **4 Claims**



A portable wall partition adapted to subdivide floor space into optionally adjustably-sized privacy modules. The wall partition has a free-standing upright frame which substantially defines the shape of the partition. Disposed on either side of the frame is a layer of acoustic barrier material. The partition is enveloped in an aesthetic flexible covering. Demountable feet support the partition upon the floor.

3,713,475

SHELL MOLDS

Henry M. Roelofs, Chicago, and William J. Lafferty, Lansing, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Jan. 4, 1971, Ser. No. 103,923
Int. Cl. B22c *9/12*
U.S. Cl. 164—26 **5 Claims**

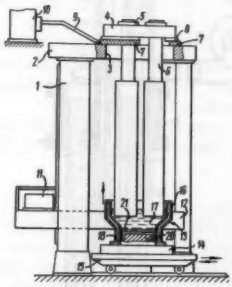
A shell mold characterized by a slip coat and an overlying stucco coat is dried by immersing the shell thus prepared in a fluidized bed of desiccant, whereafter the bed is collapsed to invest the shell with the desiccant.

3,713,476

INSTALLATION FOR MAKING INGOTS AND METHOD THEREFOR

Boris Evgenievich Paton, ulitsa Kotsjubinskoyo 9, kv. 21; Boris Izrailevich Medovar, bulvar Lesi Ukrainki 2, kv. 8; Jury Vadimovich Latash, Vozdukhoflotsky prospekt 48, kv. 14; July Georgievich Emelyanenko, ulitsa Darvina 5, kv. 5; Leonid Mikhailovich Stupak, Brest Litovsky prospekt 39, kv. 9; Vitaly Mikhailovich Baglai, ulitsa Semashko 10, kv. 54/3, and Jury Fedorovich Alferov, bulvar Lepse 29, kv. 64, all of Kiev, U.S.S.R.

Filed May 8, 1969, Ser. No. 823,024
Int. Cl. B22d *27/02*
U.S. Cl. 164—52 **40 Claims**



An installation for making ingots and the method of operation of the installation are disclosed. The ingots are produced by electroslag remelting one or more consumable electrodes in a mould which is designed to retain a slag bath in the upper part thereof and to form an ingot in the lower part thereof. The mould is provided with a bottom plate with a projection extending up into the mould upon which the ingot, as it is

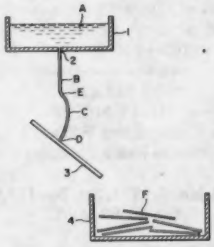
formed, is supported. During remelting of the electrode to form the ingot the electrode and the bottom plate are maintained in fixed position relative to one another and the mold is moved upwardly with respect to the ingot during its formation. In this manner, the heat loss from the ingot is decreased in order to prevent cracking of the ingot produced. The internal cross-sectional area of the lower part of the mold is a factor of 0.8 to 1.2 of the cross-sectional area of a single electrode or of the total cross-sectional area of the plurality of electrodes being simultaneously remelted in the installation.

3,713,477

METHOD OF MANUFACTURING METALLIC SHORT FIBERS

Yoshihiro Kuniyasu, Kawasaki; Akio Matsumoto; Eiji Isobe, both of Tokyo, and Kenji Someno, Tokyo, all of Japan, assignors to Mitsui Mining & Smelting Co. Ltd., Tokyo, Japan

Filed Feb. 26, 1971, Ser. No. 119,196
Claims priority, application Japan, June 22, 1970, 45/54185
Int. Cl. B22d *11/12*
U.S. Cl. 164—69 **5 Claims**



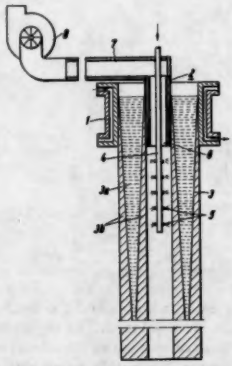
A method of manufacturing metallic short fibers comprising the steps: making the melt flow out through a small orifice under elevated pressure; and making the resulting solidified endless metallic fiber run against a slant cooling device to thereby break it into pieces of fixed length.

3,713,478

METHOD FOR INTERNAL COOLING OF CAST TUBES

Gerd Vogt, Krefeld; Johannes Kurth, Gelsenkirchen; Manfred Strohschein, Gelsenkrichen, and Josef Glaser, Gelsenkrichen, all of Germany, assignors to Firma Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Division of Ser. No. 826,453, May 21, 1969, abandoned. This application Dec. 6, 1971, Ser. No. 205,105
Claims priority, application Germany, May 22, 1968, P 17 58 393.6
Int. Cl. B22d *11/12*
U.S. Cl. 164—85 **1 Claim**



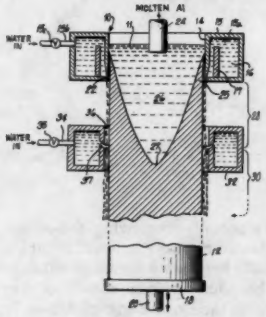
Continuously cast tubes are internally cooled in that the entire amount of water sprayed upon the tube's inner surface could vaporize and escape through the mandrel at a speed below the speed of sound in steam.

3,713,479

DIRECT CHILL CASTING OF INGOTS

Neil Burton Bryson, Kingston, Ontario, Canada, assignor to Alcan Research and Development Limited, Montreal, Quebec, Canada

Filed Jan. 27, 1971, Ser. No. 110,190
Int. Cl. B22d *11/12*
U.S. Cl. 164—89 **19 Claims**



In a direct chill casting of metal (e.g. aluminum) ingots, wherein an externally solidified ingot having an initially molten core is progressively withdrawn from a shallow, cooled, open-ended mold to which molten metal is progressively supplied, the ingot emerging from the mold passes successively through a first cooling zone extending from the mold for a predetermined distance along the path of ingot advance, and a second cooling zone located at that predetermined distance from the mold. Separate supplies of coolant fluid are respectively directed onto the ingot surface in the two zones, in such manner that the coefficient of heat transfer from the ingot to the coolant is substantially greater in the second zone than in the first. Specifically, the restricted intensity of cooling provided in the first zone is selected to maintain the outer portion of the ingot in solid state but preferably without completely solidifying the ingot core as the ingot traverses the first zone, while the greater intensity of cooling in the second zone effects complete solidification of the ingot core and simultaneously provides a high rate of cooling of the ingot periphery.

3,713,480

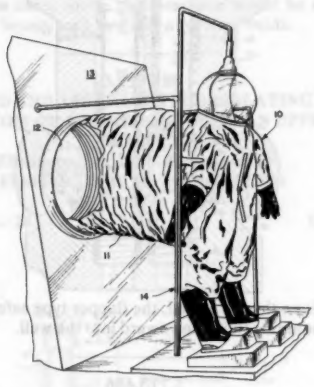
AIR CONDITIONED SUIT

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and George R. Carl, Malvern, Pa.

Filed Oct. 27, 1970, Ser. No. 84,290
Int. Cl. F28f *7/00*
U.S. Cl. 165—46 **10 Claims**

An environmentally controlled suit consisting of an airtight outergarment attached by an airtight bellows to the wall of a sterile chamber, an undergarment providing for circulation of air near the skin of the wearer, and a circulation system comprised of air supply and distribution to the extremities of the undergarment and central collection and exhaust of air from the midsection of the undergarment. A workman wearing the

undergarment and attached circulation system enters the outer garment through a tunnel in the chamber wall and the



attached bellows to work in the chamber without any danger of spreading bacteria.

3,713,481
WELL PIPE SWAGE

Derrel D. Webb, Houston, Tex., assignor to Houston Engineers Inc., Houston, Tex.

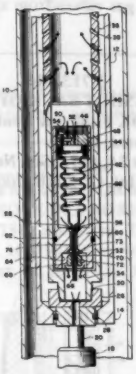
Filed Sept. 3, 1971, Ser. No. 177,579
Int. Cl. E21b *29/00*
U.S. Cl. 166—55 11 Claims

A swage which is adapted to be jarred upwardly as well as downwardly against restrictions within a well pipe in response to rotation of a running tool from which the swage is suspended within the pipe.

3,713,482
GAS FLOW REGULATOR FOR WELLBORE CATALYTIC HEATERS

Henry P. Lichte, Jr., 4130 Villanova, Houston, Tex., and Edward F. Schultze, 3005 Larry Drive, Dallas, Tex.

Filed May 4, 1971, Ser. No. 140,170
Int. Cl. E21b *43/24*
U.S. Cl. 166—59 14 Claims

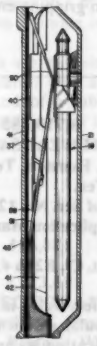


A downhole bellows operated regulator valve is used to control the flow rate of a fuel gas to a catalytic wellbore heater. The bellows is located in tubing and is responsive to the pressure differential between the interior and exterior of the tubing. A valve connected with the bellows is fashioned to respond to the bellows so that fuel flow to the catalyst is controlled, and backflow of formation fluids through the catalyst is prevented.

3,713,483
WELL SERVICING APPARATUS

Ronald J. Robicheaux, 17971 Spicewood Way, Irvine, Calif.

Filed Feb. 12, 1971, Ser. No. 114,831
Int. Cl. E21b *7/06*
U.S. Cl. 166—117.5 12 Claims



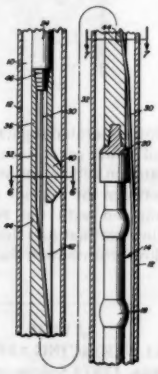
Well servicing apparatus in the form of an improved tubing section for wells, in the form of an improved tool for servicing wells, and in the form of the combination of an improved tubing section and tool. Cooperating conformations on the tubing and tool permit orientation of the tool and longitudinal positioning of the tool relative to the tubing in response to force

applied longitudinally of the tool. The tool and tubing are arranged so that, having reached predefined orientation and position, the tool is locked in place. It comprises at least two main parts and it is one of those parts that is locked in place. The other is relatively movable to that locked part and a work mechanism included within the tool accomplishes its work as an incident to that relative movement. After a predefined amount of movement, the main parts of the tool are locked against relative movement and the tool responds to increased force to become unlocked from the tubing to permit its withdrawal. The example selected for illustration is arranged to install and remove gas valves from side pocket tubing sections.

3,713,484
STRINGSHOT BACK-OFF TOOL

Claude W. Gray, c/o OK Fishing & Rental Tools, Inc., Post Office Box 10131, Houma, La.

Filed June 24, 1971, Ser. No. 156,230
Int. Cl. E21b *7/00*
U.S. Cl. 166—117.5 **7 Claims**



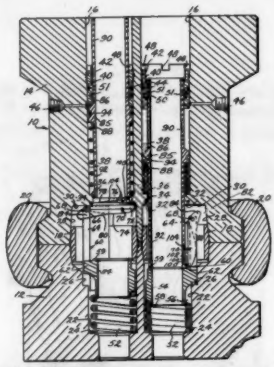
Back-off of a blocked tubing fish in a well bore is effected by firing a stringshot positioned in the well bore externally of the tubing below the blocked section. The stringshot is lowered to its position through a guide tool from which an overshot is suspended in gripping engagement with the top of the fish.

3,713,485
PETROLEUM WELL SAFETY VALVE

Marvin L. Holbert, Jr., Houston, Tex., assignor to Gray Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 123,805, March 12, 1971, abandoned. This application March 15, 1971, Ser. No. 124,411
Int. Cl. E21b *43/00*
U.S. Cl. 166—224 **21 Claims**

By preference, the safety valve is mounted in a tubing bonnet throughbore. A tubular piston mounted above the valve flapper has a communication to an exterior supply of fluid pressure tending to force the piston down so it opens the flapper; subterranean pressure is active against the opposite side of the piston. The lower end of the piston seats against an annular shoulder on the member which carries the flapper to isolate the valve seat and flapper sealing surface from wear while the valve is in an open condition. The rear of the flapper is angled to cause first incidence of flapper opening force at the part of the flapper furthest from the trunnions. A sacrificial wear feature is also incorporated into the rear of the

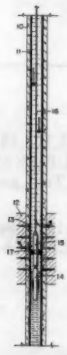


flapper. Even though closed, the flapper type safety device allows for pumping fluids downward into the well.

3,713,486
METHOD OF PLUGGING BACK A WELL

Victor C. Meitzen, Kingsville, Tex., assignor to Esso Production Research Company

Int. Cl. E21b *47/00, 29/00*
U.S. Cl. 166—250 **5 Claims**



A method of plugging back a tubingless well cased with small diameter pipe which requires an accurate determination of the well depth by wireline measurements. The perforated interval in the tubingless well is located by pumping fluid into the well past a flow restricting tool attached to the lower end of a wireline. A decrease in the wireline load indicates when the flow restricting tool has entered the perforated interval which establishes the depth of the perforated interval. Accurate depth control with the wireline is thereby obtained. A tubing stop is set above the perforated interval and a cement squeeze is displaced into the perforated interval with a conventional cement wiper plug until the wiper plug bumps on the tubing stop. The remainder of the workover utilizes conventional perforating methods.

3,713,487
EXPLOSIVE FRACTURING AND PROPPING OF PETROLEUM WELLS

Walter R. Lozanski, Calgary, Alberta, Canada, assignor to Dri-Frac Limited, Brooks, Alberta, Canada

Filed Dec. 30, 1970, Ser. No. 102,945
Int. Cl. E21b *43/26*
U.S. Cl. 166—280 **4 Claims**

A method of stimulating the flow of petroleum fluids in a well. Explosive fracturing of the petroleum formation adjacent

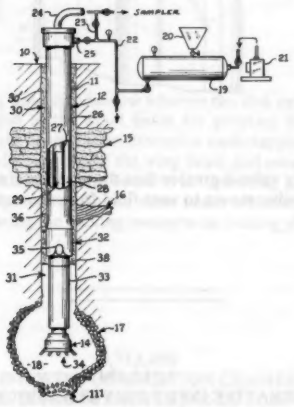
to the well is carried out in the presence of a propping agent, such as glass beads, sand or aluminum particles. The propping agent-explosive combination is preferably surrounded by granular ammonium nitrate explosive to insure the absence of voids in the well bore. The method avoids the necessity for the use of liquids for fracturing or propping, and this is advantageous in cases where the formation would be damaged by the use of liquids such as water or drilling fluids.

3,713,488

METHOD AND APPARATUS FOR ISOLATING THE BOTTOM OF A BOREHOLE FROM AN UPPER FORMATION

Wayland D. Ellenburg, Box 1588, Monahans, Tex.

Filed Feb. 22, 1971, Ser. No. 117,504
Int. Cl. E21b *33/14*
U.S. Cl. 166—285 **12 Claims**



Improved drilling method for isolating the bottom of a borehole from an upper formation by the provision of a cross-over sub which is used in conjunction with a concentrically arranged dual pipe string. A bit is connected to the pipe string by the sub, and drilling fluid is circulated down the drill string annulus, through the sub, and to the bit, while cuttings are returned along with the drilling fluid from the bit, through a radial passageway formed in the sub, and to the inner tubing of the drill string.

When it is desired to isolate the upper borehole annulus or a formation from the bottom of the borehole, a blocking agent is forced down the inner tubing, out through a radial passageway of the sub, and against or into the formation adjacent to the borehole. Drilling is then resumed with the bottom of the borehole being isolated from the upper borehole annulus.

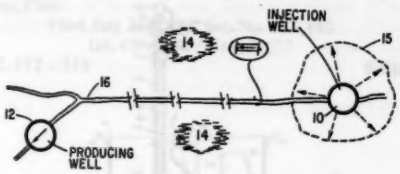
3,713,489

PLUGGING OF FRACTURES IN UNDERGROUND FORMATIONS

Clarence R. Fast, and Morton A. Mallinger, both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 16,205, March 3, 1970, abandoned. This application Sept. 8, 1970, Ser. No. 70,100
Int. Cl. E21b *33/138, 43/16*
U.S. Cl. 166—292 **17 Claims**

This information concerns a method of selectively plugging fractures in an underground formation by injecting a slurry of finely divided non-settling solids into the fracture. The finely divided solids disclosed are fly ash, amorphous silica, and finely divided limestone. These solids have a particle size smaller



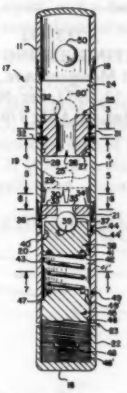
than 50 mesh U.S. Standard Sieve Series. Suitable water loss additives and viscosity reducers are disclosed.

3,713,490

METHOD AND APPARATUS FOR SPOTTING FLUID DOWNHOLE IN A BOREHOLE

Billy Ray Watson, Box 756, Monahans, Tex.

Filed Dec. 16, 1970, Ser. No. 98,832
Int. Cl. E21b *43/25*
U.S. Cl. 166—305 **13 Claims**



Method and apparatus for isolating the perforated area or production zone of a borehole, and subjecting the isolated portion to chemical treatment in a manner which enables the chemical to be placed into intimate contact with the production formation.

The apparatus includes a pre-loaded regulator type check valve assembly in combination with a by-pass means which is supported on the trail end of a tubing string. The by-pass means, when actuated, enables flow to occur in by-pass relationship to and from the tubing and borehole, and around the check valve assembly.

3,713,491

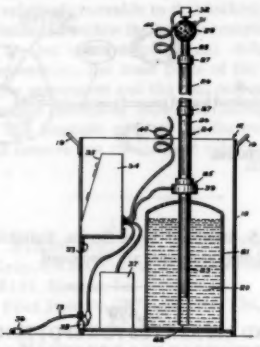
FIRE PROTECTION APPARATUS

George J. Grabowski, Needham, Mass.; William B. Osborne, Marlboro, Mass., and Rexford Wilson, Wellesley, Mass., assignors to Walter Kidde & Company, Inc.

Division of Ser. No. 770,926, Oct. 28, 1968, Pat. No. 3,605,901. This application March 11, 1971, Ser. No. 123,282
Int. Cl. A62c *25/00*
U.S. Cl. 169—2 R **21 Claims**

A portable automatic fire protection system is disclosed comprising battery powered, independent suppressor units

each including a supply of fire extinguishing fluid and a fire detector. Connection of the individual unit's control circuits



provides a control circuit network that automatically initiates extinguishing fluid discharge from all units in response to fire detection by any single unit.

3,713,492

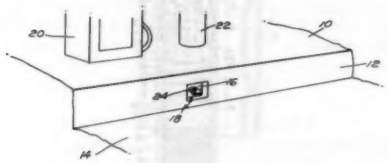
FIRE EXTINGUISHING SYSTEM

Leonard W. Forrest, 31 Moorland Ave., Providence, R.I.

Filed May 12, 1971, Ser. No. 142,542

Int. Cl. A62c *3/00*

U.S. Cl. 169—2 R **6 Claims**



A fire extinguishing system for gas stations and the like of the type having an island on which the gas pumps are mounted, the system comprising spaced nozzles mounted in or on the curb of the island and a source of pressurized fire extinguishing dry chemical power with conduit means interconnecting said source and said nozzles, whereby when the system is operable, the dry chemical powder will emit from said nozzles in a pressurized spray characterized by an upward trajectory.

3,713,493

SAFETY VALVE FOR USE IN FILLING OF FIRE EXTINGUISHERS

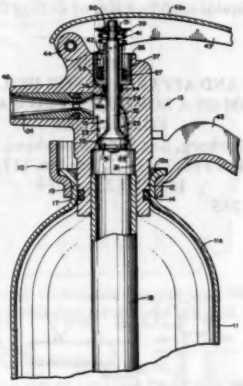
Arne Hansen, New City, N.Y., assignor to Walter Kidde & Company, Inc., Belleville, N.J.

Filed Nov. 10, 1971, Ser. No. 197,349

Int. Cl. A62c *13/00*

U.S. Cl. 169—31 R **12 Claims**

A safety valve for use in filling of fire extinguishers and the like is disclosed. There is provided the usual storage container for containing fire extinguishing chemicals under pressure and having a control head attached thereto at one end. The control head is provided with a pair of discharge passages in fluid flow communication with the interior of the container. A main valve seals one of the passages and a safety valve is provided to seal the other passage. Preferably, the two passages are continuous so that a stem of the main valve extends from the one passage into the other. The safety valve is acted upon by the fluid when the main valve is open. A compression spring is connected between the stem and the safety valve tending to close the latter when the former is open. When fluid pressure



on the safety valve is greater than the pressure from the spring, the safety valve moves to vent fluid from the container to the atmosphere.

3,713,494

ALTERNATIVE INPUT DRIVES ON HOUSING OF GEARBOX FOR TOOLS ROTATING ABOUT VERTICAL AXES

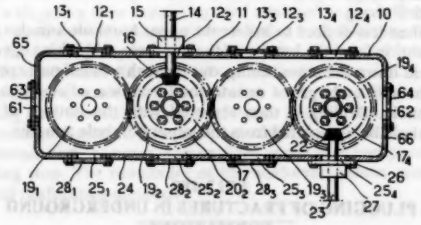
Albert Berdrin, 119 Avenue de General-Leclerc, Paris, France

Filed Oct. 7, 1970, Ser. No. 78,692

Claims priority, application France, Oct. 10, 1969, 6934671

Int. Cl. A01d *33/08*; F16h *37/06*

U.S. Cl. 172—59 **2 Claims**



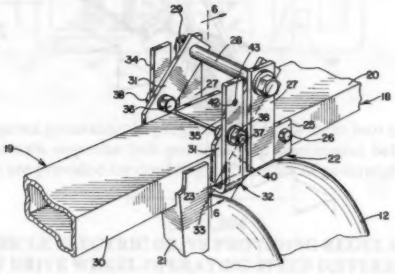
An agricultural machine with tools adapted to rotate around vertical axis. The tools are carried by shafts located in a housing enclosing intermeshing gear means for driving the shafts by driving one of them only, apertures closable by covers being provided on the faces of the housing for the passage of a driving shaft.

3,713,495

AUTOMATIC DISK HARROW HINGE LOCKING DEVICE

Robert L. Redford, Westmont, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 10, 1970, Ser. No. 71,036
Int. Cl. A01b 65/02; E05d 11/10
U.S. Cl. 172—456 1 Claim



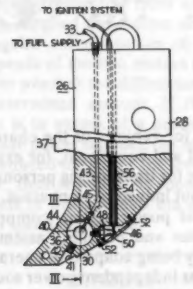
In a folding wing disk harrow wherein the disk carrying wing beam is hinged to the main beam for pivoting in a vertical plane, the main beam has an extension underlapping and supporting the adjacent end of the wing beam and means are provided for locking the wing beam in its operating position in a horizontal alignment with the main beam including yieldable means for biasing the locking means to its locking position.

3,713,496

RIPPER PLOW WITH COMBUSTION CHAMBER IN TIP TO EFFECT FRACTURING OF SOIL

James B. Codlin, Springfield, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Continuation of Ser. No. 25, Jan. 2, 1970, abandoned. This application Jan. 7, 1972, Ser. No. 216,309
Int. Cl. A01b 13/08
U.S. Cl. 172—699 4 Claims



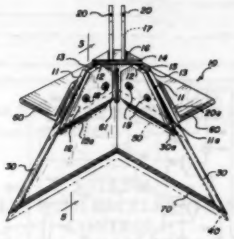
A tractor drawn ripper for fracturing earth is provided in its tip with a combustion chamber which vents to both sides of the ripper tip. A passage in the ripper communicates with the chamber and intermittently supplies a combustible fuel mixture thereto from an outside source. A spark plug projects into the chamber and is adapted to fire the combustible fuel mixture to cause repetitive explosions which loosen the earth adjacent the ripper as the latter moves along and permits it to be more easily drawn through the earth.

3,713,497

REPLACEABLE BLADE ROW CROP DITCHER WITH BEDDING RAIL

Roy I. Hawkins, Pierce, Colo., assignor to Hawkins Mfg. Inc., Pierce, Colo.

Filed July 29, 1971, Ser. No. 167,102
Int. Cl. A01b 39/14, 32/22
U.S. Cl. 172—719 5 Claims



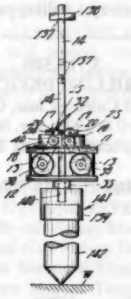
An Agricultural V-Shape Crop Ditcher Tool having a replaceable blade held between spring-tensioned members that are normally held apart, and a bedding rail attached to each wing of the tool to control lateral movement of the soil.

3,713,498

ELECTRIC MOTOR HAMMER AND STRIKING TOOL

Hikoitsu Watanabe, 5-13, 1-chome, Ebara-cho, and Sanji Genma, 4-8, 1-chome, Ebara-cho, both of Tokyo-to, Japan

Filed April 2, 1971, Ser. No. 130,728
Claims priority, application Japan, Sept. 22, 1970, 45/82567
Int. Cl. E21b 1/00; E02d 7/00
U.S. Cl. 173—53 10 Claims

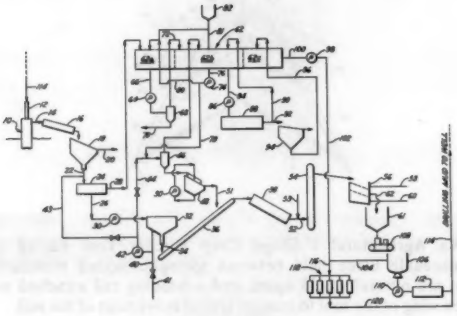


This is an electric motor hammer and striking tool which permits striking with strong impact given by the dropping of motors with acceleration by it own weight and which makes use of the driving force of such motors for lifting the hammer itself up to any desired height and the weight for striking operation, comprising two motors fixed in balance on a supporter, two rollers driven by such motors through reduction gear means, and a guide rod held between such two rollers, which are rotated holding the guide rod until they reach any predetermined height vertically along the guide rod, where released automatically from being held on the guide rod and the motor hammer starts dropping by its own weight for giving strong impact as described above, whereby striking operation is kept on by repeating such up and down motions of the motors.

3,713,499
METHOD AND APPARATUS FOR TREATING DRILLING MUD

Raymond L. Arscott; Eber W. Gaylord, both of Pittsburgh; Ernest A. Mori, Glenshaw, and Richard A. Morris, Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 11, 1971, Ser. No. 170,709
Int. Cl. E21b 7/18
U.S. Cl. 175—66 13 Claims

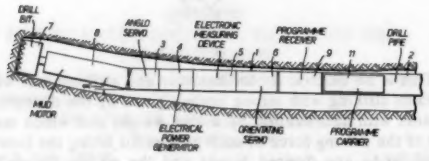


A method for treating drilling mud discharged from a well in an abrasive jet drilling process using ferrous abrasives to recondition the drilling mud for reuse in which the drilling mud is passed over a shale shaker to remove oversized cuttings and is then delivered into a magnetic separator in which the abrasive particles are separated from the major portion of the drilling mud. The ferrous abrasive particles from the separator are further cleaned of drilling mud in a centrifugal cleaner and dried. The dried abrasive particles are screened to remove broken abrasives, and the resultant sized abrasive particles are stored in a dry condition in a hopper from which they are introduced into drilling mud at a controlled rate and recirculated through the abrasive jet drilling process.

3,713,500
DRILLING DEVICES

Michael King Russell, 3 Culross Close, Cheltenham, England

Filed April 8, 1970, Ser. No. 26,538
Claims priority, application Great Britain, April 8, 1969, 17,868/69
Int. Cl. E21b 7/04
U.S. Cl. 175—73 6 Claims

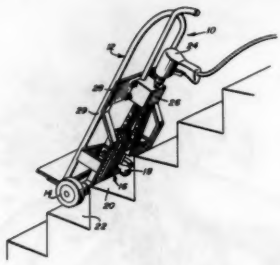


Control means for fitting at the lower end of a drill pipe adjacent drilling means to control directional drilling comprise servo means for changing the drilling angle and further servo means for turning the control means with respect to the drill pipe axis in order to reorientate the device without changing the drilling angle. The control means also comprise means for programming and/or controlling both servo means by signals set in, or transmitted from, above ground.

3,713,501
POWER HAND TRUCK

Robert H. Hurt, 421 North State, Kent, Wash.

Filed Nov. 6, 1970, Ser. No. 87,561
Int. Cl. B60p 9/00
U.S. Cl. 180—9.22 5 Claims

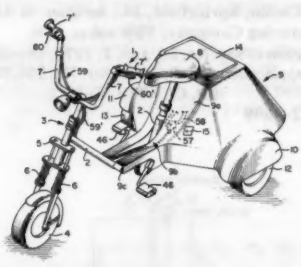


A hand truck frame mounts an endless chain belt having a perpendicularly extending bulb-like member connected thereto. As the belt rotates, the bulb-like member engages a step and causes the hand truck to be elevated to a vertically succeeding step. A manually operated clutch selectively links the chain belt with the wheel axle of the hand truck thereby powering the wheels, which is desirable on flat ground.

3,713,502
DUAL POWERED VEHICLE

John J. Delaney, West Pittston, Pa., and Henry O. Gervais, Mountaintop, Pa., assignors to Northeastern Pennsylvania Research and Development Co., Inc., Pittston, Pa.

Filed Sept. 3, 1969, Ser. No. 854,897
Int. Cl. B62k 11/00
U.S. Cl. 180—27 8 Claims



Drive arrangement for vehicles of the character employed to transport personnel and equipment, for example, golf cart or an industrial vehicle for transporting personnel and supplies between and throughout industrial plant areas, or the like, said vehicles having a dual power system comprising a battery operated electric motor and pedalling assembly, the motor and pedalling assembly being adapted to operate conjointly as a source of power, or as independent power sources, at the option of the user.

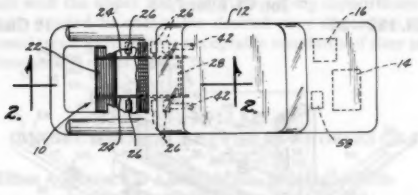
3,713,503
VEHICLE GENERATOR SYSTEM

Harold U. Haan, Parkersburg, Iowa

Filed March 1, 1971, Ser. No. 119,743
Int. Cl. H02j 7/14, 7/32
U.S. Cl. 180—65 R 6 Claims

An electrically powered vehicle having fan-driven generators or alternators selectively individually engageable by the

driver such that as the speed of the vehicle increases and the air reaching the fan increases, additional generators may be powered. A wedge cam is adapted to move between rows of



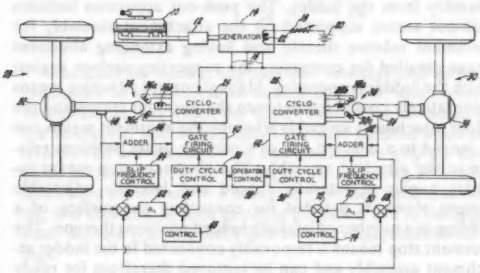
staggered generators to progressively move them into engagement with opposite belt portions of a continuous belt. Two belts are provided for doubling the number of generators.

3,713,504

VEHICLE ELECTRIC DRIVE PROVIDING REGULATION OF DRIVE WHEEL OPERATING SPEED DIFFERENCE

Daniel W. Shimer, Warren, and Jalal T. Salihi, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 26, 1971, Ser. No. 146,886
Int. Cl. B60l *11/08*
U.S. Cl. 180—65 R **2 Claims**



A vehicle electric drive system includes two electric power supplies connected respectively to energize front and rear drive AC induction motors to propel front and rear sets of drive wheels through respective front and rear differentials. The AC voltages supplied the motors are comprised of substantially rectangular voltage pulses of alternating polarity. The operating speeds of the two motors are sensed and compared to ascertain whether the difference in operating speeds exceeds a predetermined amount. If the sensed operating speed difference is in excess of a predetermined value, the width of the voltage pulses supplied the motor operating at the higher speed is reduced to reduce the level of the voltage supplied that motor, thus reducing its speed to ensure that the front and rear sets of drive wheels are operated with a controlled maximum speed difference.

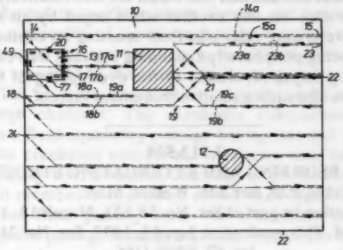
3,713,505

AUTOMATICALLY STEERED SELF-PROPELLED VEHICLE

Wolfram Muller, Leck, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed April 26, 1971, Ser. No. 137,354
Claims priority, application Germany, April 25, 1970, P 20 20 220.4
Int. Cl. B62d *5/04*
U.S. Cl. 180—79.1 **21 Claims**

A self-propelled vehicle is automatically reversed and steered to a new path if sensors thereon sense an obstruction surrounding an area, or an obstacle in the area so that the vehicle moves forward, rearward and laterally over the entire



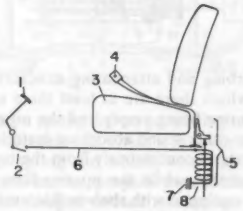
unobstructed area for treating the same with a tool, such as a brush or agricultural implement.

3,713,506

SAFETY BELTS WITH DECELERATION RELEASE CONTROL

Paul Lipschutz, Neuilly-sur-Seine (Hauts de Seine), France, assignor to Societe D'Exploitation des Brevets Neiman, Neuilly-sur-Seine, France

Filed June 18, 1970, Ser. No. 47,322
Claims priority, application France, June 20, 1969, 6920632
Int. Cl. B60r *21/10*
U.S. Cl. 180—82 **9 Claims**



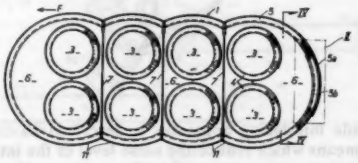
A safety belt anchorage device for use in vehicles comprising a check device having a pinion rotatably mounted in a casing, a chain engaging the pinion teeth and at one end adapted to be secured to the end of a safety belt, a torsion spring for rewinding the chain on said pinion, and an axially sliding member for positively locking the pinion against free rotation, and control means actuated upon braking or deceleration of the vehicle.

3,713,507

FACILITY FOR CONFINING A PRESSURIZED FLUID CUSHION FOR A GROUND-EFFECT MACHINE

Jean Henri Bertin, Neuilly-sur-Seine; Maurice Paul Berthelot, issy-les-Moulineaux, and Guy Robert Delamare, Herblay, all of France, assignors to Societe D'Etudes Et De Developpement Des Aeroglisseurs Marins Torrestres Et Amphibies S.E.-D.A.M., Paris, France

Filed April 28, 1970, Ser. No. 32,615
Claims priority, application France, April 30, 1969, 6913944
Int. Cl. B60v *1/16*
U.S. Cl. 180—127 **6 Claims**



A facility for confining pressure fluid cushioning of a ground-effect machine, the facility comprising an endless flex-

ible skirt or wall having a part in double thickness, such part being formed by the placing one above another of two panels which contact one another but which are free relatively to one another to slide on one another when urged by an internal overpressure arising inter alia from meeting an obstacle, the skirt thus being peripherally expanding but skirt wall continuity not being impaired, thanks to the overlapping of the two panels, notwithstanding relative movement thereof.

3,713,508

SOUND ABSORBING AND ATTENUATING STRUCTURE

Oliver C. Eckel, P.O. Box 226, Weston, Mass.

Continuation-in-part of Ser. No. 18,531, March 11, 1970, abandoned. This application Jan. 13, 1972, Ser. No. 217,455

Int. Cl. E04b *1/86*

U.S. Cl. 181—33 GB **6 Claims**

A sound absorbing and attenuating structure has an outer support within which there are at least three compartments, the intermediate one being empty and the others being filled with fiber glass or other sound absorbing material. Two of said compartments extend continuously from the top extremity to the bottom extremity, while the intermediate compartment also does, but is equipped with shelves that extend alternately left to right and right to left. Covers at the top and bottom extremities close my structure.

3,713,509

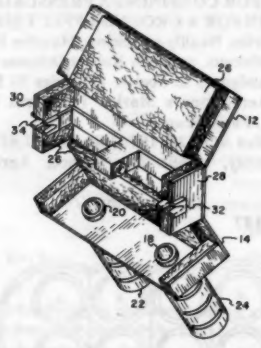
TEXTILE NOISE REDUCTION DEVICE

Harlan R. Carroll, Taylors, S.C., assignor to Fiber Industries, Inc.

Filed Sept. 24, 1971, Ser. No. 183,386

Int. Cl. G10k *11/00*; F01n *1/10*

U.S. Cl. 181—33 K **5 Claims**



A textile interlacing apparatus is described having noise abating means which reduce the noise level of the interlacing apparatus in an amount ranging from 12 to 21 or more decibels. The interlacer is surrounded with a sound proofing chamber coupled with muffled exhaust ports.

3,713,510

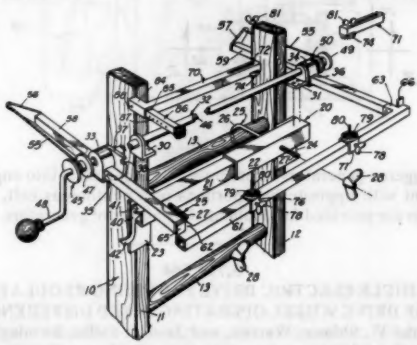
LADDER PUSH-OUT APPARATUS

Rawleigh D. O'Dell, 807 North Avenue, N.E., Atlanta, Ga., assignor to Ulace J. O'Dell, Lewisburg, Ohio, a part interest

Filed March 10, 1971, Ser. No. 122,311

Int. Cl. E06c *7/48*

U.S. Cl. 182—20 **10 Claims**



A push-out apparatus adapted to be attached to a ladder for moving the ladder to a selected adjusted position relative to a surface against which the ladder is supported. The push-out apparatus includes a ladder attachment assembly having releasable connecting means for securing the assembly in a set position on the ladder and for permitting ready removal of the assembly from the ladder. The push-out apparatus includes push-out means supported on the attachment assembly for movement relative thereto and having extending abutment means detailed for contacting the supporting surface against which the ladder is operating. Manual control adjusting means is operatively connected between the push-out means and the ladder attachment assembly whereby the abutment means can be moved to a selected one of a number os set positions relative to the attached assembly. The abutment stop means includes a pair of laterally spaced and laterally adjustable bumper elements detailed for contacting the surface of a building at a number of laterally spaced positions thereon. The abutment stop means is removably connected to the ladder attachment assembly and can be removed therefrom for ready attachment to a second support assembly which can be secured to the ladder in order that the abutment stop means can be used on the ladder without the use of the push-out means.

3,713,511

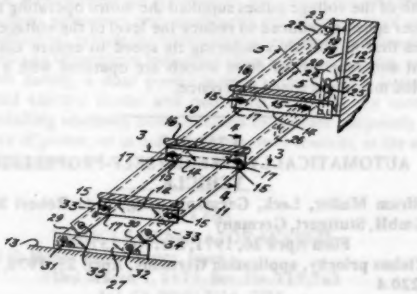
ADJUSTABLE STAIR ASSEMBLY

Lloyd A. Hinkle, 216 Piedmont Avenue, Piedmont, Mo.

Filed June 14, 1971, Ser. No. 152,791

Int. Cl. E06c *9/10*

U.S. Cl. 182—95 **7 Claims**



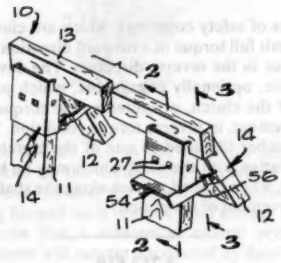
An adjustable stair assembly in which the stair treads are adjustably supported on stringers so that the exposed tread sur-

face may be selectively determined in proportion to the riser dimension from tread to tread, and the stringers are telescoped into upper and lower supports which anchor the assembly in the desired final position. In the assembly the stringers are used in pairs at each end of the treads and in conjunction with the upper and lower telescoping supports are selectively spaced to obtain the desired riser dimension and exposed tread width within acceptable standards of riser to tread dimensional ratios.

3,713,512
CONNECTOR BRACKET FOR SAWHORSES OR THE LIKE

Milton A. Reece, 120 Annadale Rd., Pasadena, Calif.

Filed Jan. 4, 1971, Ser. No. 103,369
Int. Cl. E04g *1/32*; F16m *11/00*
U.S. Cl. 182—226 **11 Claims**

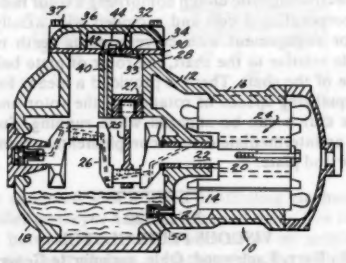


A bracket for connecting together two legs and an upper crosspiece of a sawhorse or similar structure, and including two elements into which the upper ends of the sawhorse legs are insertable, and having upper portions adapted upon relative pivotal movement of the two elements to grip the crosspiece of the sawhorse, with a toggle linkage being actuable by downward movement of a manually operated handle to swing the two elements to their gripping positions, and to simultaneously actuate gripping teeth into holding engagement with the legs.

3,713,513
CRANKCASE EVACUATION AND OIL RETURN SYSTEM

Bradford Foster Harris, Murray Hill, and Tommaso F. Scarfone, Jersey City, both of N.J., assignors to Fedders Corporation, Edison, N.J.

Filed June 10, 1971, Ser. No. 151,824
Int. Cl. F01m *1/12*
U.S. Cl. 184—6.16 **18 Claims**

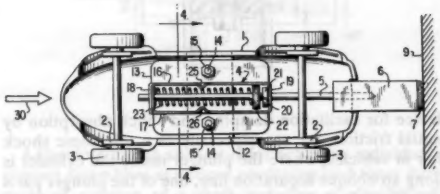


A refrigeration motor compressor unit comprising a housing separated by a partition into a crankcase compartment and a motor compartment. The partition defines an oil return passage connecting the motor compartment with the crankcase compartment, the passage having a one-way check valve mounted therein which permits a flow of fluid to take place only from the motor compartment to the crankcase compartment. The crankcase compartment defines a plurality of cylinders adapted to receive pistons therein and has a valve plate having a plurality of apertures therein mounted to it, with at least one of the apertures being a suction port. A cylinder head is mounted to the crankcase housing and is constructed to define at least one suction chamber and at least one discharge chamber. The crankcase compartment housing defines a fluid equalizing passage having one end cooperating with the crankcase compartment interior and the other end cooperating with a suction chamber of the cylinder head. A conduit member is connected to the fluid equalizing passage to direct fluid passing from the crankcase compartment through the passage towards a suction port of the valve plate.

3,713,514
TOY AND DELAYED RELEASE PROPELLING MECHANISM THEREFOR

Enrique A. Cosp, Jejui 438, Asuncion, Paraguay

Division of Ser. No. 69,812, Sept. 4, 1970, Pat. No. 3,670,453.
This application July 28, 1971, Ser. No. 167,004
Int. Cl. F03g *1/00*
U.S. Cl. 185—37 **2 Claims**

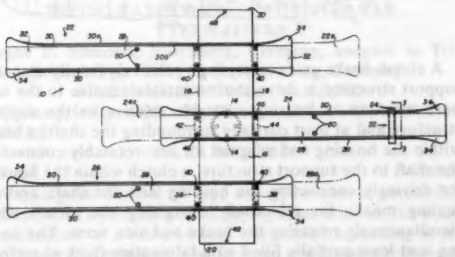


A toy having a spring driven propelling mechanism including an axially movable rod which is propelled to the rear of the vehicle by the spring and which, when the vehicle is placed against a vertical barrier, propells the vehicle forward by reaction force. The delayed release mechanism includes a frame having parallel sides and end walls in which the rod is journaled for axial movement. The sides have indentations which extend inwardly toward, but do not contact, the rod and its surrounding spring. The rod carries an elastic member which is pushed forwardly of the indentations when the spring is compressed. The spring gradually forces the elastic member past the indentations and, when the elastic member is clear of the indentations, the spring is permitted to rapidly expand, suddenly causing the rod to move toward the barrier, causing the vehicle to rapidly move forward.

3,713,515
VEHICLE LIFT

Ion V. K. Hott, Dayton, Ohio, assignor to the Joyce-Cridland Company, Dayton, Ohio

Filed Sept. 11, 1968, Ser. No. 759,190
Int. Cl. B66f *7/00*
U.S. Cl. 187—8.41 **7 Claims**



For elevating three-wheeled scooters and similar vehicles above floor levels to a convenient height for servicing, a lift is

provided with three wheel runways which are slidable toward and away from one another. A wheel chock of unique design is described for appropriate positioning of a three-wheeled vehicle on the lift.

3,713,516

TELESCOPIC SHOCK ABSORBER FOR VEHICLES

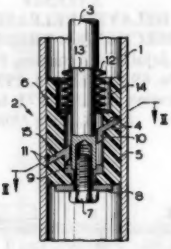
Adalbert Freyler, Brillerstrasse 99, Wuppertal-Elberfeld, Germany

Filed Aug. 2, 1971, Ser. No. 167,913

Claims priority, application Germany, May 5, 1971, P 21 22 118.1

Int. Cl. F16f 7/08; B60g 13/04

U.S. Cl. 188—129 **8 Claims**



A device for oscillation damping and shock absorption by differential friction, for use especially as a telescopic shock absorber in vehicles, where the plunger inside the cylinder is split along an oblique separation line, one of the plunger parts being axially preloaded against the others to create radial frictional pressure and differential axial friction resistance, depending upon whether the plunger motion is coincident or opposite to the preload.

3,713,517

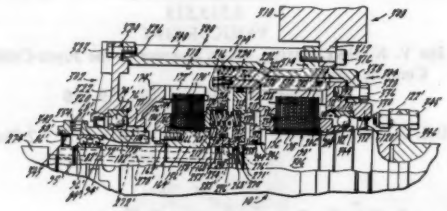
CLUTCH-BRAKE WITH LIQUID AND AIR COOLING

Gordon M. Sommer, Grosse Pointe Woods, Mich., assignor to G. M. Sommer Co., Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 804,771, March 6, 1969, Pat. No. 3,614,999. This application Aug. 2, 1971, Ser. No. 167,990

Int. Cl. F16d 67/04

U.S. Cl. 192—18 A **10 Claims**



A clutch-brake unit comprising a relatively fixedly mounted support structure, a drive shaft rotatable relative to the support structure, a housing rotatable relative to the support structure and at least partially surrounding the shaft, a brake within the housing and adapted for non-rotatably connecting the shaft to the support structure, a clutch within the housing for drivingly connecting the housing with the shaft, and actuating means for selectively energizing the clutch while simultaneously releasing the brake and vice versa. The housing is at least partially filled with lubricating fluid wherefrom heat is adapted to be transferred by contact with the housing and a driving member connected therewith.

3,713,518

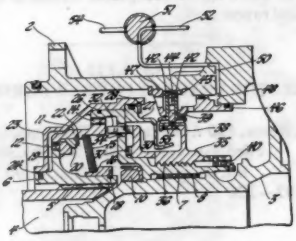
DECOUPLER CONTROL

Cyril Hawkins, 2643 North Vinewood Drive, Indianapolis, Ind.

Filed March 3, 1971, Ser. No. 120,450

Int. Cl. F16d 41/00

U.S. Cl. 192—46 **6 Claims**



Two forms of safety couplings, which are clutching devices which transmit full torque in a forward direction and definitely limited torque in the reverse direction. The devices include a lockin feature, optionally engageable, which prevents disengagement of the clutch, or increases the torque requirement for disengagement, in reverse torque condition. The lockin includes a member threaded to one of the clutched shafts and normally rotative with the shaft which may be braked against rotation and, when braked, moves along the shaft to block disengaging movement of the clutch.

3,713,519

ELECTROMAGNETIC CLUTCHES

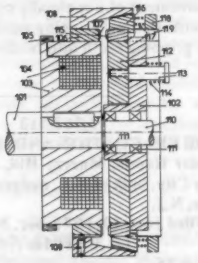
Gabriel Ruget, 7 Cours Fauriel, Saint-Etienne, France

Filed Dec. 9, 1970, Ser. No. 96,471

Claims priority, application France, Dec. 10, 1969, 6942612; Nov. 10, 1970, 7041454

Int. Cl. F16d 23/06, 27/09

U.S. Cl. 192—53 D **7 Claims**



An electromagnetic clutch comprising a rotor fast on a shaft and incorporating a coil and provided with axially directed teeth for engagement with corresponding teeth on a plate rotatable relative to the shaft, the rotor or plate being axially movable of the shaft. There is provided a means for substantially equalizing speeds of rotation of the rotor and plate so that the clutch can be engaged while running. Such means may be an intermediate disc or complementary formations on the rotor and plate.

3,713,520

VISCOUS FLUID CLUTCH

Lamar L. Kerr, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

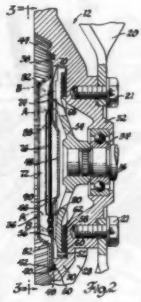
Filed April 29, 1971, Ser. No. 138,490

Int. Cl. F16d 35/00

U.S. Cl. 192—58 B **4 Claims**

A viscous fluid clutch including relatively rotatable first and second drive members having a fluid shear space

therebetween and which are cooperable with a fluid medium in the shear space to provide a shear-type fluid drive therebetween, an annular reservoir for at times storing the fluid medium, an internallymounted preloaded temperature-responsive bimetallic valve member for regulating the flow of the fluid medium from the annular reservoir to the fluid shear space, the bimetallic valve member being mounted at one end



thereof on the divider wall in the reservoir and extending across the center of the clutch unit to control an opening between the reservoir and the operating chamber, the cover member being formed such that the fluid storage space in the reservoir assures that a substantial central portion of the bimetallic element will remain uncovered by fluid and thus be continuously exposed to ambient air.

3,713,521

ROLLER PROVIDED WITH SPEED CONTROLLING MECHANISM FOR ARTICLES BEING CONVEYED ON A ROLLER CONVEYOR

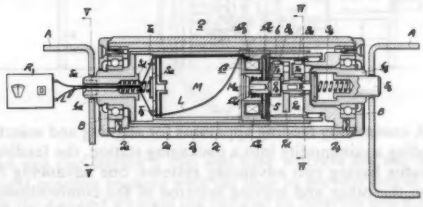
Koiti Moritake, Takatsuki, Japan, assignor to Kabushiki Kaisha Takenishi Seisakusho, Sagisu, Fukushima-ku, Osaka, Japan

Filed Aug. 24, 1971, Ser. No. 174,480

Claims priority, application Japan, Oct. 12, 1970, 45/101733

Int. Cl. B65g *13/00*; H02p *3/00*

U.S. Cl. 193—37 **5 Claims**



A roller equipped with a speed controlling mechanism for use in a roller conveyor having a group of many free rollers in alignment between frames. The motion of an article being conveyed on the rollers is transmitted to the inside of the roller and operates a generator as the roller is turned. If desired a speed change mechanism can be provided. The electromotive force generated by the generator is supplied to an electromagnetic brake, by which electrical braking force is produced to effect regularion of the speed control of the roller.

3,713,522

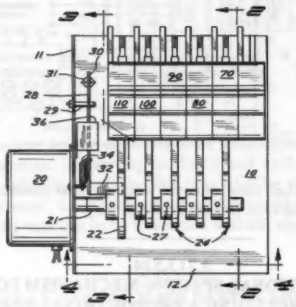
COIN CONTROLLED ADJUSTABLE TIMER

Malcolm J. Estrem, Edina, Minn., assignor to The Cornelius Company, Anoka, Minn.

Continuation of Ser. No. 795,389, Jan. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 696,673, Dec. 11, 1967, abandoned. This application May 8, 1970, Ser. No. 33,170

Int. Cl. G07f *5/10*

U.S. Cl. 194—9 T **7 Claims**



Adjustable timing apparatus for actuating individual switch contact assemblies at various predetermined times during the cycle of rotation of a shaft including a plurality of cams characterized by the inclusion of a peripheral involute actuating surface which further includes a switch contact resetting portion. Individual switch contact assemblies are removably disposed in operative position adjacent to a cam whereby a cam follower type of switch contact actuator is biased into adjustable continuous contact with the peripheral surface of each of the cams. Means are provided for effecting rotation of the shaft, upon which the cams are disposed, at a predetermined substantially constant rotational velocity. Further means are provided to be responsive to tokens supplied thereto for controlling and initiating the operation of the timing apparatus. A suitable slot adapted to receive tokens is provided with a removable stop for arresting the motion of a coin and further means are provided for generating a signal in response to the presence of the token. The signal is utilized to initiate operation of the timer. Prior to the end of the timing cycle of operation, the removable stop means is actuated to allow release of the token into a collection receptacle.

3,713,523

TYPING RATE CONTROL FOR TYPE BAR TYPEWRITERS

Jurgen P. Niemietz, Nuernberg, Germany, assignor to Triumph Werke Nuernberg A. G., Nuernberg, Germany

Filed March 2, 1970, Ser. No. 15,373

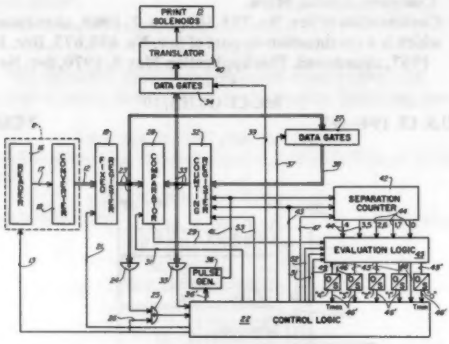
Claims priority, application Germany, March 13, 1969, P 19 12 661.5

Int. Cl. B41j *5/30*

U.S. Cl. 197—19 **9 Claims**

A typing rate control for type bar typewriters to permit the realization of optimum overall typing rates wherein the code identification of a selected type bar, coded according to its position in a type basket, is held stored and is operative to call and cause the type bar it represents to print. The relative type bar position of the next to be called type bar and that of the

type bar position in storage is ascertained by high speed counting logic circuitry and used to delay the call of the next type



bar only over that time interval necessary to assure that the previously called type bar is out of the way.

3,713,524

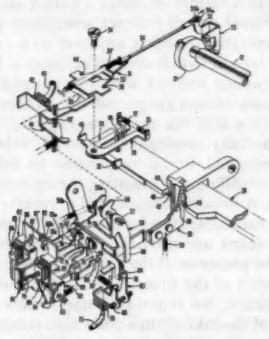
BI-DIRECTIONAL SPACING MECHANISM FOR A PRINTER INCLUDING A PROPORTIONAL SPACING PRINTER

James S. Forrest; John R. Litkenhus, both of Lexington, and Donald J. Steger, Corinth, all of Ky., assignors to International Business Machines, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,124

Int. Cl. B41j *19/58*

U.S. Cl. 197—84 R **18 Claims**



A character printing position is displaced by various increments in forward and reverse directions by premeasured motion delivered to a movable letter spacing member through a shuttling control rack. A variable stop member is moved to select the desired amount of spacing movement by arresting the control rack, which is yieldably driven via a spring through a potential stroke during each cycle.

3,713,525

DEVICE FOR COMPOSING TEXT PORTIONS ON A BLANK SHEET IN ACCORDANCE WITH A LAY-OUT

Ole Peter Troing, Slagelsegade 3, 2100 Copenhagen, Denmark

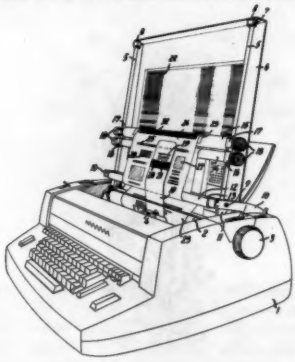
Filed May 5, 1970, Ser. No. 34,846

Claims priority, application Denmark, May 8, 1969, 2531/69

Int. Cl. B41j *11/44*

U.S. Cl. 197—181.2 **4 Claims**

A device for use in connection with a typewriter to compose text portions on a blank sheet in accordance with a prepared lay-out. The device comprises a frame which can be mounted on the typewriter and in which one or more guide rollers are rotatably supported in parallel and adjustable relationship to the typewriter platen. The blank and lay-out sheets are temporarily connected together at their lower and upper edge, respectively, and the composite sheet thus formed is tracked



over the platen and the guide roller or rollers. An indicator member connected to the typewriter in a predetermined relationship to its point of stroke or printing point, marks the location on the lay-out sheet which at any time corresponds to the location on the blank sheet where a type actuated by the opera-tor writes a character.

3,713,526

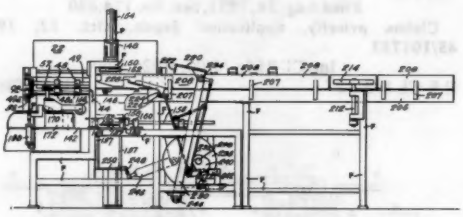
PACKAGING APPARATUS

Wolfgang Hoffmann, Beaconsfield, Quebec, and Paul Wick, Valois, Quebec, both of Canada, assignors to Canadian International Paper Company, Montreal, Quebec, Canada

Division of Ser. No. 734,029, June 3, 1968, Pat. No. 3,579,956. This application Feb. 1, 1971, Ser. No. 111,580

Int. Cl. B65g *47/26*

U.S. Cl. 198—34 **16 Claims**



A commodity feeding apparatus for aligning and selectively feeding a commodity into a packaging station, the feeding apparatus having two advancing systems, one advancing faster than the other and moving selected of the commodities at a faster rate to separate the selected commodities from the remainder thereof and advance same into the packaging station.

3,713,527

ELEVATOR-FEEDER STRUCTURE

Gary D. Ginther, Leonard, Mich., assignor to Clyde Corporation, Troy, Mich.

Filed Sept. 16, 1971, Ser. No. 181,098

Int. Cl. B65g *47/14, 47/24*

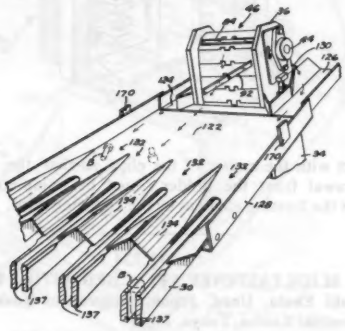
U.S. Cl. 198—53 **55 Claims**

Endless elevator band has horizontal and sloped article elevating flights which respectively discharge articles frontally

and laterally for distributing them over the width of a receiving chute. The chute is divided into a plurality of converging wall channels, each funneling articles into a feed track.

The sloped flights are secured only at their central portions to the band, the ends of the flights being free of attachment thereto to facilitate flexing of the band. Side rails contain articles on the sloped flights and the rails are tapered outwardly to prevent wedge-locking of articles thereagainst.

The supply hopper for the elevator has a sloped bottom and



a vertical baffle spaced from the band. The bottom edge of the baffle is spaced from the hopper bottom to define a restricted opening for limiting the mass of articles bearing against the band.

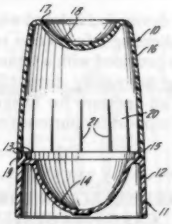
A return chute returns to the hopper articles which fail to lodge in the feed tracks.

A cover plate is spaced from the band below the hopper bottom. To relieve jamming of articles received in the space the plate is sloped outwardly in an upward direction and is yieldably spring biased to closed condition.

3,713,528
EGG CUP

Robert Daenen, Erembodegem, Belgium, and James B. Swett, Barrington, R.I., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed May 1, 1970, Ser. No. 33,731
Int. Cl. A47g *19/28*; B65d *43/08*
U.S. Cl. 206—1 **4 Claims**



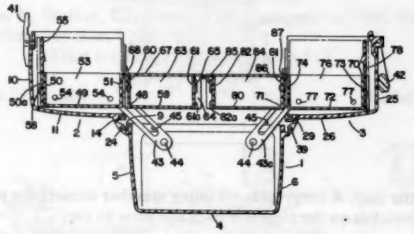
An egg cup having a cap and base wherein the cap in an upright position engages with the base to prevent loss of heat from the egg and wherein the cap can be inverted and utilized to hold the egg while the egg is being broken.

3,713,529
PORTABLE CONTAINER FOR FISHING TACKLE AND THE LIKE

Bernard Meksula, 13215 Maplerow Ave., Garfield Heights, Ohio

Filed Feb. 24, 1971, Ser. No. 118,439
Int. Cl. A45c *11/00*; B65d *85/54*
U.S. Cl. 206—16 R **5 Claims**

A portable container for fishing tackle and the like is described, in which tiers of trays are provided, with the uppermost tray in each tier having a lid, these uppermost trays being so arranged and hinged to other trays as to be movable into contiguity with each other, whereby the lids conjointly provide a table of substantial size for various purposes. The arrangement, moreover, is such as to permit the contents of

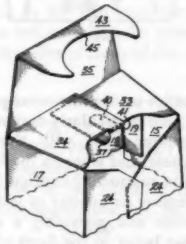


more than one tray in each tier to be simultaneously examined by a fisherman, to thereby facilitate and extend his range of selection of baits, etc. The lids may also be made of a transparent plastic, to thereby enable the contents of the trays covered by said lids to be examined without opening the lids.

3,713,530
DISPLAY CARTON WITH DUST FLAP LOCKING CONSTRUCTION

Jimmy J. Hanko, Des Plaines, Ill., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 25, 1971, Ser. No. 109,273
Int. Cl. B05d *5/50*
U.S. Cl. 206—45.14 **9 Claims**



A display carton has article holding panels at each end, and open front panels to allow access to the article. The front panels may extend behind the article, and also maintain certain holding panels in place. The unsupported front edges of the side walls are prevented from bowing outwardly by locking the dust flaps together. The dust flaps overlap. A locking tab on a first dust flap is folded back around the second dust flap, and an outwardly extending detent on the second dust flap prevents the tab from slipping off the second flap.

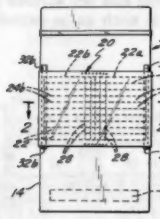
3,713,531
CIGARETTE PACKAGE WITH A SELF-CONTAINED PACKET OF MATCHES

George C. Doumas, 168 East 2nd Street, New York, N.Y.

Filed Nov. 20, 1970, Ser. No. 91,418
Int. Cl. B65d *79/00*
U.S. Cl. 206—48 **1 Claim**

A cigarette package with a self-contained packet of matches wherein the matches are releasably secured by an adhesive to the cigarette enclosure. The matches are advantageously formed with a striking head disposed on the underside of each individual match, so that the matches are stored with the match head disposed between the match body and the cigarette enclosure. An adhesive releasably secures the

matches to the cigarette enclosure at a point whereby the end of the match away from the match head is free to be gripped



by the user. A removable retaining member secures the packet of matches on the cigarette package prior to use.

3,713,532

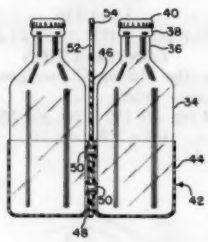
BOTTLE CARRIER DEVICE

John J. Tanzer, 8501 West Higgins Road, Brookfield, Wis.

Filed Oct. 9, 1970, Ser. No. 79,411

Int. Cl. B65f *85/30*

U.S. Cl. 206—65 E **2 Claims**



A carrier for bottles or the like arranged in package form, such as a six-pack, and particularly designed for bottles of the molded glass envelope type with thin and substantially uniform wall thickness, and wherein the bottom of the bottle, which is often of non-supporting configuration, is capped with a cup-like base member or coaster of less brittle material for protecting the bottle and providing a self-supporting base therefor; the carrier being in the form of a sheet of suitable material, as plastic, with one or more vertical walls lapped with the side walls of the base members and secured thereto by releasable fastening means by which the package may be supported for transport by grasping handle grip means adjacent the tops of the packaged bottles; the handle grip means being adjacent the top of a single vertical wall disposed between rows of bottles in the package, or being on a horizontal shelf portion joining two vertical walls in which case the vertical walls are disposed exteriorly of the bottles and joined to corresponding exterior side wall portions of the cup-like base members.

3,713,533

HEMOSTATIC CLIP HOLDER

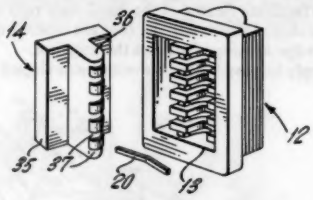
Harry G. Reimels, Braintree, Mass., assignor to Codman & Shurtleff, Inc.

Continuation-in-part of Ser. No. 38,986, May 20, 1970, abandoned. This application April 28, 1971, Ser. No. 138,055

Int. Cl. A61b *17/12*; **B65d** *83/00*

U.S. Cl. 206—56 DF **20 Claims**

A clip holder for securely retaining a plurality of partially formed hemostatic clips prior to withdrawal of the clips by a clip applicator is constructed to provide a plastic housing having a generally rectangular opening therethrough and opposed inwardly directed shoulders at one end of the opening for supporting only the ends of the clips. A clip forming element having an outer surface configuration conforming to the contour of a completely formed clip is positioned within the housing in



contact with the center of the clips, so that, the clips, upon withdrawal from the holder, must be completely formed against the forming element by the clip applicator.

3,713,534

SLIDE FASTENER ATTACHED WITH A TUG

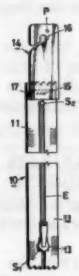
Hiroyuki Ebata, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1972, Ser. No. 226,061

Claims priority, application Japan, Feb. 15, 1971, 46/7832

Int. Cl. B65d *73/00*; **A44b** *19/36*

U.S. Cl. 206—80 **5 Claims**



A slide fastener device is disclosed which is provided with a label or tag for indicating information relative to the fastener product. The tag is provided with a transversely extending fold for folding the tag therealong outwardly or inwardly of the fastener and with an aperture for hanging the fastener vertically on a suitable support for purposes of display.

3,713,535

AUTOMATIC CARD SELECTOR FOR RANDOM-ACCESS CARD FILE SYSTEM

Stanley Engelstein, New York, and Isidore Dorman, Whitestone, both of N.Y., assignors to Bell & Howell Company, Chicago, Ill.

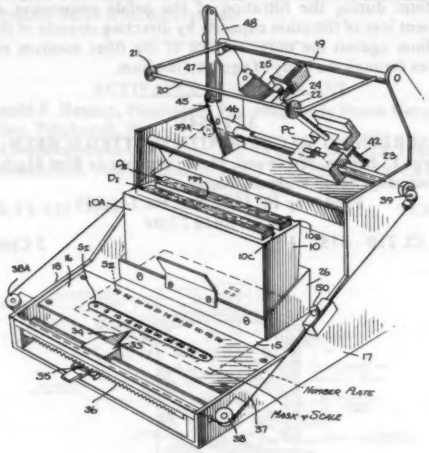
Continuation-in-part of Ser. No. 118,455, Feb. 24, 1971. This application Dec. 2, 1971, Ser. No. 204,160

Int. Cl. B07c *5/36*

U.S. Cl. 209—80.5 **17 Claims**

A random-access card file system formed by cartridges for storing the cards and an automatic card selector adapted to extract any desired card therefrom regardless of its location in the cartridge. Each cartridge is capable of accommodating at least one deck of cards. Each card in the deck includes an upstanding tab whose longitudinal position is related to a particular point on a linear scale extending the full length of the deck. The selector is provided with a carriage movable to a position in registration with any desired incremental point on the scale, the carriage bearing a crane having a card picker

thereon, whereby when the carriage of the selector is set to a particular position and a switch is actuated, the crane completes an operating cycle in the course of which it is



caused to bow down over the cartridge to permit the picker to engage and clamp onto the tab of the selected card and to then lift the card from the cartridge onto a presentation bar.

3,713,536

PRESSURE PULP SCREEN

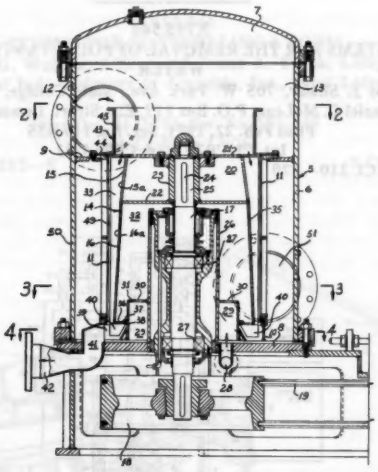
Sydney W. H. Hooper, Sherbrooke, Quebec, Canada, assignor to S. W. Hopper & Co., Ltd., Sherbrooke, Quebec, Canada

Filed Nov. 30, 1970, Ser. No. 93,671

Claims priority, application Great Britain, May 11, 1970, 22,552/70

Int. Cl. B07b *1/20*

U.S. Cl. 209—273 **15 Claims**



A pulp screen of the vertical pressure type having a cylindrical screen and an impeller mounted for rotation within the screen, a conical core on the impeller shaft defines a primary screening compartment below the pulp stock inlet compartment and a secondary screening compartment below the primary compartment, the conical core has a first angled wall defining an upper annular stock screening area of the primary compartment, a series of pairs of blades radiate from the conical core and define a series of radial passages extending the length of the core, and dilution water is fed to the radial passages and to the face of the screen.

3,713,537

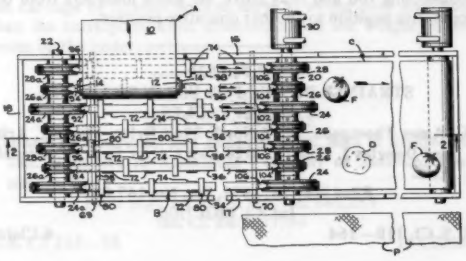
SCREENING CONVEYOR

William B. Walker, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 24, 1970, Ser. No. 66,512

Int. Cl. B07b *1/10*

U.S. Cl. 209—307 **4 Claims**



A screening conveyor for sifting out undersized fruit and breaking up and sifting out clods of dirt or similar materials includes longitudinally spaced drive and idler pulley shafts with each shaft mounting a row of different diameter pulleys on one shaft aligned with matched pulleys on the other shaft to form matched pairs of pulleys. V-belts are trained around the matched pairs of pulleys to form a series of troughs of a uniform depth. The drive shaft causes adjacent belts to run at different speeds for churning, sifting and sorting materials supported and advanced by the belt members. U-shaped cleats are spaced along the belt members for assisting in the action and for working on the sides of clods of dirt or the like, carried along in the troughs.

3,713,538

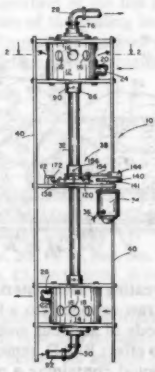
CYCLE VALVE FOR FILTERS

Charles L. Kass, 22 Bloomingdale Drive, Scarsdale, N.Y.

Continuation-in-part of Ser. No. 724,079, April 25, 1968, Pat. No. 3,547,270. This application Nov. 30, 1970, Ser. No. 93,589

Int. Cl. B01d *35/12, 23/24*

U.S. Cl. 210—138 **12 Claims**



A cycle valve having an inlet chamber and an outlet chamber for passing untreated liquid to and collecting filtered liquid from a plurality of filtering tanks, respectively. The cycle valve permits a selected one of the filtering tanks to be

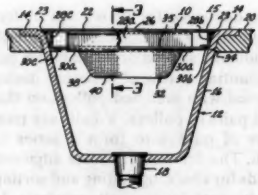
backwashed while the remaining filtering tanks continue to operate. The cycle valve is provided with cooperating valve members, one valve member being disposed in the inlet chamber and the other valve member being disposed in the outlet chamber, with the valve members being secured to opposite ends of a connecting rod. Rotation of the connecting rod effectively rotates the cooperating valve members to an operative position to backwash the selected filtering tank while the remaining filtering tanks perform their filtration operations. The cycle valve is provided with a timing device to control the length of time the selected filtering tank is backwashed, a selection device to predetermine which filtering tanks are to be back-washed, and a device to rotate the connecting rod and thus move the valve members from one operative position to another operative position.

3,713,539

STRAINER DEVICE FOR USE IN DRAINAGE RECEPTACLES

C. Ames Thompson, 5617 North 22nd Drive, Phoenix, Ariz., and Douglas J. Cooper, 7820 East Culver Street, Scottsdale, Ariz.

Filed May 26, 1971, Ser. No. 147,059
Int. Cl. E03f *1/00*
U.S. Cl. 210—164 **6 Claims**



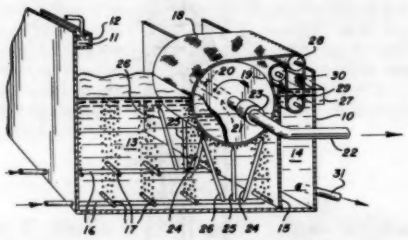
A strainer device is disclosed for use in floor sinks, roof drains, and other similar drainage receptacles. The strainer device is removably mounted adjacent to the upper portion of the drainage receptacle and is adapted to captively retain foreign material entering therein.

3,713,540

APPARATUS FOR TREATING WASTE MATERIALS

Roger Davidson, Arlington Heights, Ill., and Fumio F. Sako, San Jose, Calif., assignors to FMC Corporation

Filed April 15, 1971, Ser. No. 134,335
Int. Cl. B01d *33/06*
U.S. Cl. 210—391 **1 Claim**



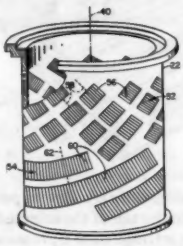
The method of treating waste materials, such as sewage, involves introducing raw sewage into a body of aqueous medium, aerating said body of aqueous medium to maintain solids in suspension and to effect B.O.D. removal, withdrawing a sufficient volume of liquid containing a minor amount of solids for discharge as a surcharge free sewage disposal effluent to compensate for the volume of influent waste material in order to maintain a relatively constant volume for said body of aqueous medium, said withdrawn liquid being the filtrate which has passed through a movable filter subject to submerged surface cleaning so that the filter medium while submerged in said body of aqueous medium is being maintained substantially free of solids that normally would accumulate on the filter medium during the filtration of the solids suspension and prevent loss of filtration capacity by directing streams of fluid medium against the outer surface of the filter medium as it passes through the body of aqueous medium.

3,713,541

SCREENING MACHINE WITH SLOTTED SCREEN

George L. Nelson, Westwood, Mass., assignor to Bird Machine Company, South Walpole, Mass.

Filed May 10, 1971, Ser. No. 141,639
Int. Cl. B01d *27/04*
U.S. Cl. 210—415 **5 Claims**



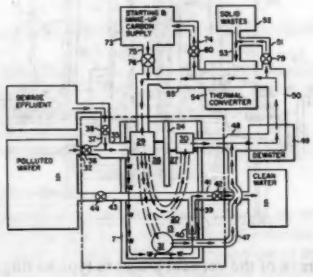
A machine for screening liquid fiber suspension, having a screen with elongated slots disposed along the flow path of the suspension which changes in direction along its length, is made more efficient and plug-free by arranging the slots in at least two areas of the flow path with the long aces of the slots in one area at an angle to the long axes of the slots of the other area such that the slots of said areas have their long axes at substantially a uniform angle, preferably approximately a right angle, to the direction of flow of suspension over them despite difference in said flow direction in the respective areas.

3,713,542

SYSTEMS FOR THE REMOVAL OF POLLUTANTS FROM WATER

Amos J. Shaler, 705 W. Park Ave., State College, Pa., and Daniel C. McLean, P.O. Box 117, Elm Street, Lemont, Pa.

Filed Feb. 22, 1971, Ser. No. 117,435
Int. Cl. C02b *1/14*; C02c *5/02*
U.S. Cl. 210—170 **4 Claims**



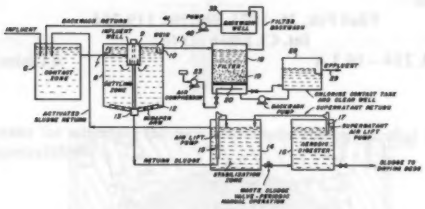
An inorganically polluted waterway is bridged by a dam containing a wall of carbon. The carbon is continuously regenerated by cycling through a thermal converter. Organically polluted sewage effluent and water from the waterway are continuously mixed and piped to the top of the wall of car-

bon, passed through the wall of carbon, and clean water is continuously drained from the bottom of the wall of carbon. An alternative installation is positioned adjacent to a restricted-flow body of water in an excavation to maintain the necessary water level differentials.

3,713,543
ACTIVATED SEWAGE PLANT

Donald F. Heaney, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 761,616, Sept. 23, 1968, abandoned. This application Jan. 12, 1970, Ser. No. 2,103
Int. Cl. C02c *1/06*
U.S. Cl. 210—196 **9 Claims**

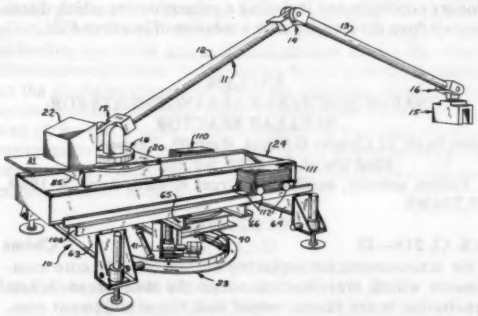


There is disclosed an activated sewage disposal plant of the compact or so-called "packaged" type and a method of processing sewage wherein a fast filter is provided through which the effluent liquid from the primary processing is passed, provision being made for backwashing the fast-flow filter from time to time with the backwash being collected in a well or vessel from which it is recycled at a controlled rate to the raw sewage. The entire plant can be embodied in a compact package unit, one common type of which comprises two concentric tanks, the outer one of which is divided into several compartments.

3,713,544
SYSTEM FOR CONTROLLING A BOOM

Donald G. Wallace, Attica, and James A. Turek, Lafayette, both of Ind., assignors to Araneida, Inc., West Lafayette, Ind.

Filed Oct. 21, 1971, Ser. No. 191,435
Int. Cl. B66c *17/06*
U.S. Cl. 212—5 **8 Claims**

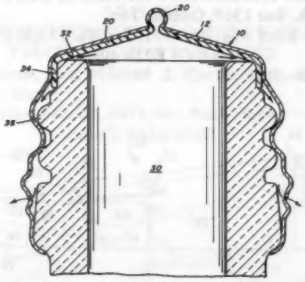


A system for controlling a boom has an undercarriage adapted for placement on the ground and a superstructure mounted on the undercarriage for rotation about a vertical axis. The undercarriage includes means for adjusting the elevation of and for leveling the superstructure, means for controlling the azimuth of the superstructure, and means for resisting torsion induced in the superstructure. The superstructure includes corner outrigger jacks for support in addition to that provided by the undercarriage, and it has a frame to which are mounted elongated parallel rails. A movable carriage is mounted on the rails by means of preloaded pressure wheels to prevent deflection of the carriage from the horizontal and to eliminate relative rotational motion between the carriage and rails. A pair of side counterweights are also mounted on the superstructure on rails to either side of rails supporting the carriage. The counterweights are connected to the carriage by flexible links to move in an opposite direction than the carriage so as to counterbalance the weight of the boom on the undercarriage.

3,713,545
VENTING CLOSURE

Kenneth C. Lawrence, and James B. Mills, both of Richmond, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sept. 14, 1971, Ser. No. 180,259
Int. Cl. B65d *51/16*
U.S. Cl. 215—56 **10 Claims**



A sheet metal container closure is provided which has a top panel and a depending skirt for affixation to a container and a sealing liner of resilient deformable material underlying the top panel of the closure for sealing against a sealing surface of the container, and further having a score line centrally located in the top panel of the closure, which score line is rupturable by excessive pressure in a container on which the closure is sealed to provide an aperture in the top panel of the closure through which a portion of the sealing liner can be forced to permit gas to escape from the container between the sealing liner and the sealing surface of the container.

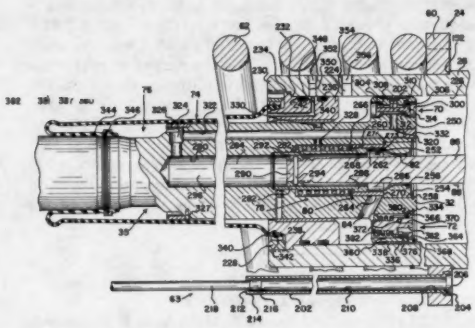
3,713,546
CUSHIONING ARRANGEMENT FOR RAILROAD CARS

David W. Daugherty, Jr., Downers Grove, Ill., assignor to Cardwell Westinghouse Company

Filed Nov. 20, 1970, Ser. No. 91,383
Int. Cl. B61g *9/08, 9/16*
U.S. Cl. 213—43 **9 Claims**

A cushioning arrangement for railroad cars that is of the "end of car" cushioning type and includes a hydraulic cylinder keyed to the car fixed center sill against buff and draft forces and having its piston rod secured to a slidably mounted coupler adapter member having flanges projecting from either side of same that each carry a resilient draft impact absorbing cushion that cooperates with fixed draft stops. A compression spring acts between the hydraulic cylinder and the adapter

member to bias the ram to its neutral position after a buff stroke, and the adapter member flanges engage over solid buff limiting stops at the end of the buff stroke. The hydraulic



cushion includes a combined programmed metering-pressure sensitive orifice and control arrangement that insures needed control over the ram to overcome train line tendencies.

3,713,547

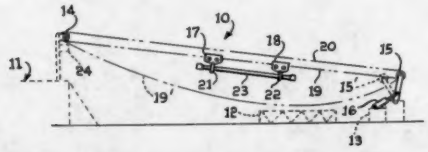
ENDLESS CABLE WAY FOR TRANSPORTING PIPE

Don D. Beck, Box 1369, Odessa, Tex.

Filed Aug. 23, 1971, Ser. No. 173,861

Int. Cl. E21b *19/14*

U.S. Cl. 214—2.5 **16 Claims**



Method and apparatus for transporting pipe between spaced apart locations comprising an endless cable disposed in proximity of the two locations and provided with pipe receiving carriages, one of which is attached to and moves with the cable. When longitudinal motion is imparted into the cable, the carriages move from one location to the other carrying the pipe therewith. The cable can be slackened to vertically move the carriages so as to enable the pipe to be placed within or removed from the carriages.

3,713,548

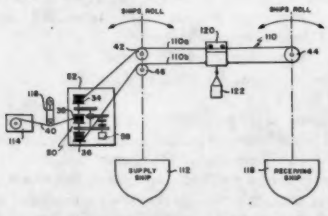
FOLDED TENSIONED HIGHLINE SYSTEM

August M. Hanke, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 21, 1971, Ser. No. 190,874

Int. Cl. B63b *27/18*

U.S. Cl. 214—13 **6 Claims**



A highline transfer system for transferring loads between ships underway at sea having a highline winch and a ram tensioner to compensate for relative ship motion and a folded highline connected to a winch having three drums. The first and second drums of the winch are connected to spool opposite ends of the folded highline and the third drum is operably connected to the ram tensioner to drive the first and second drums in relatively like directions in response to relative ship motion. A power means is connected to selectively drive the first and second drums simultaneously in relatively opposite directions for positive control of the load with respect to the receiving ship and connected to selectively drive the second drum for positive control of the load with respect to the supply ship.

3,713,549

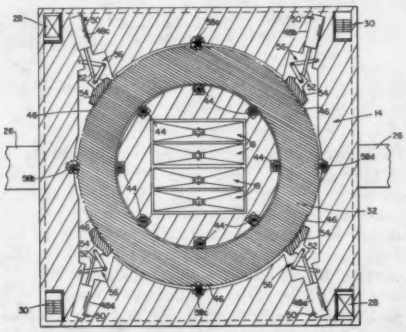
BUILDING FOR PARKING MOTOR VEHICLES

Joseph Philip Routhier, 60 Commonwealth Avenue, Boston, Mass.

Filed Feb. 26, 1971, Ser. No. 119,264

Int. Cl. E04b *1/346*

U.S. Cl. 214—16.1 A **4 Claims**



A building for parking motor vehicles at least one of the parking levels of which supports an annulus mounted for rotation with respect to that level, the building including vehicle raising and lowering means serving each level and located interior to the annulus, and two motive systems associated with the annulus to effect the rotation thereof. The first of the motive systems comprises at least one fluid operated piston connected to a foot releasably engageable with the periphery of the annulus and the second comprising means continuously engaged with the annulus, the first motive system being employed solely to initiate rotation of the annulus from a stationary condition and including a release device which disengages it from the annulus after a rotation of less than 45°.

3,713,550

CHARGE/DISCHARGE ARRANGEMENTS FOR NUCLEAR REACTOR

John Pugh, 11 Charles II Street, Winfrith, England

Filed March 24, 1970, Ser. No. 22,159

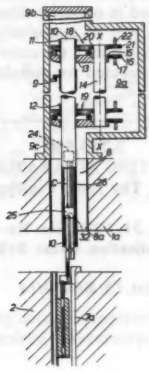
Claims priority, application Great Britain, April 3, 1969, 17,734/69

Int. Cl. G21c *19/10*

U.S. Cl. 214—27 **7 Claims**

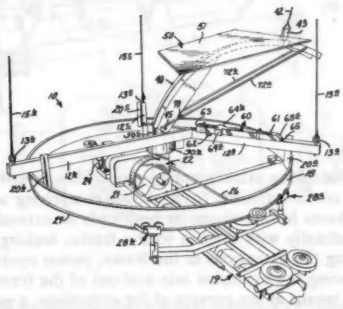
An arrangement for replacing nuclear reactor core components which are disposed about the axis of an access penetration in the reactor vessel wall, the arrangement comprising a guide tube means, said means being introducable into the penetration where, in an operative condition the tube means communicates the vessel interior with a charging compartment exteriorly thereof and an eccentric carrying a core component engaging member, means rotatably mounting the

eccentric in the tube and means for adjusting the rotational axis of the eccentric with respect to the tube axis and further



means for adjusting the axis of the tube relative to that of the penetration.

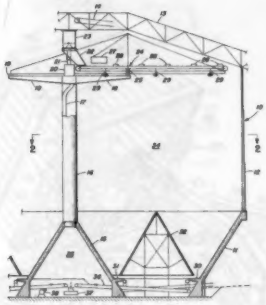
3,713,551
ATTACHMENT FOR SILO UNLOADERS
Forrest E. Moen, Route 3, Houston, Minn.
Filed Sept. 22, 1971, Ser. No. 182,692
Int. Cl. B65g *65/30*
U.S. Cl. 214—17 CB **6 Claims**



Apparatus for reversibly converting a silo unloader to a silage distributor for use in uniformly filling a silo. The apparatus includes means for pivotably attaching a silage discharge chute to the silage blower housing so as to allow pivotable movement between a first position during the silo unloading operation and a second position during the silage distribution operation. A distribution board is fixedly mounted on the discharge chute and, when the discharge chute is in its second position, deflects silage incident thereon toward the wall of the silo. Finally, a drive member is provided which is connectable to a rotatable portion of the blower housing for supporting the discharge chute in its second position and for causing rotation thereof.

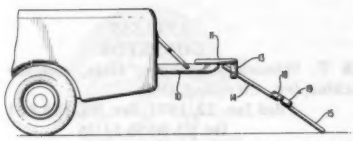
3,713,552
MECHANIZED STORAGE SILO
Aux P. Schnyder, 146 Cherry Lane, Teaneck, N.J.
Filed Sept. 18, 1970, Ser. No. 73,318
Int. Cl. B65g *65/48*
U.S. Cl. 214—17 CB **9 Claims**

A symmetrically shaped storage vessel for particulate material which material to be stored is introduced into the upper portion of the vessel and evenly distributed on a bed of the material therein by a rotating horizontally extending conveyor assembly. The lower portion of the storage vessel is provided with V-shaped wall assemblies terminating in horizontally disposed decks. Adjacent to the decks are rotating circu-



lar chute assemblies into which the particulate material is discharged by plows traversing the decks. At selective locations, the particulate material drops onto conveyor belts from the chutes, and eventually is passed from the storage vessel.

3,713,553
FOLDING MULTIPOSITION LOADING RAMP FOR TRUCKS, HAVING TAIL GATES
Edgar V. Curtis, and Mildred J. Curtis, both of Box 39, Lewistown, Mont.
Filed Feb. 23, 1971, Ser. No. 118,105
Int. Cl. B65g *67/02*
U.S. Cl. 214—85 **4 Claims**

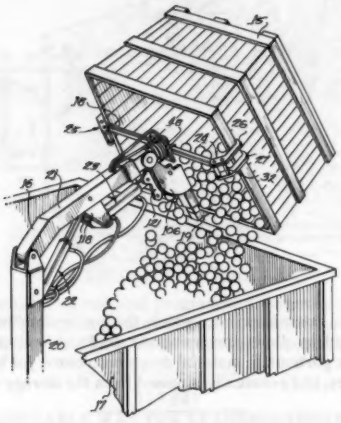


A truck loading ramp is secured to the vertically swingable truck tail gate by mounting brackets to which one section of the ramp is hinged. The ramp includes a second section hinged to the first ramp section and adapted to be rigidly locked in extended or folded positions. The folded ramp is also lockable to the mounting brackets in either of two carrying positions with the truck tail gate down or up.

3,713,554
CONTAINER-DUMPING APPARATUS
Larry O. Thompson, Lake Wales; William J. Gilbert, Plymouth; Louis R. Thompson, Winter Garden; James W. Martin, Jr., Apopka, and William Lamar Clements, Windermere, all of Fla., assignors to Peterson Industries, Inc., Lake Wales, Fla.
Filed Feb. 22, 1971, Ser. No. 117,236
Int. Cl. B65g *67/22, 67/46*
U.S. Cl. 214—147 AS **15 Claims**

A container-dumping apparatus is provided which is particularly suitable for use with citrus and the like. The apparatus includes a lift bar which is rotatably mounted on the end of a lift device such as a crane or boom. The lift bar carries clamp arms on each end thereof which are operatively connected to hydraulically operated pistons carried by the lift bar for movement into and out of a container-engaging position. The lift bar is supported on the end of a cylindrical shaft which is rotatably supported by a connecting block swingably mounted on the end of the lift device. A vane is fixed to the

shaft within the fluid chamber of a rotary actuating device secured to the connecting block, and the shaft may be rotated as desired by introducing pressurized hydraulic fluid into the chamber on one or the other side of the vane. A generally L-



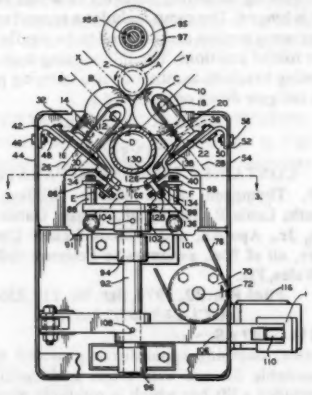
shaped support arm is also swingably mounted on the end of the lift device and is operatively connected to a hydraulic piston and cylinder assembly for swinging the support arm and the container about the end of the lift device.

3,713,555

CONVEYOR

Joseph T. Wloszek, Cuyahoga, Ohio, assignor to Custom Machine, Inc., Cleveland, Ohio

Filed Jan. 22, 1971, Ser. No. 108,807
Int. Cl. B65h 51/26
U.S. Cl. 214—339 **1 Claim**



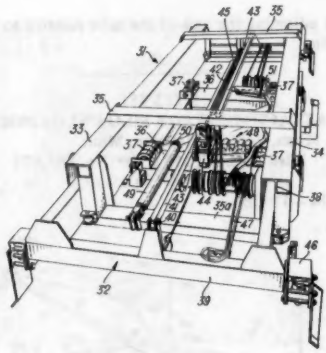
A conveyor for simultaneously rotating and advancing cylindrical articles, such as lengths of pipe along a predetermined path of movement. Rollers having substantially spherical surfaces are mounted in two spaced parallel rows with the planes of rotation of the rollers in each row being parallel to each other. Roller drive is by a cylindrical member rotating on a fixed axis engaging the two rows of rollers from below, while the conveyed pipe lies in the trough formed by the two rows of rollers. The angle of the planes of rotation of the two rows can be simultaneously varied in opposite directions about an axis through the pipe by a pair of oppositely movable operating members extending the length of the conveyor and the mounting means are interconnected for simultaneous angle variation.

3,713,556

LIFTING APPARATUS

John Hubert Tredray, The Holt, Aspleyguise, Bletchley, England

Filed Aug. 31, 1970, Ser. No. 68,249
Claims priority, application Great Britain, Sept. 2, 1969, 43,433/69
Int. Cl. B66f 9/14
U.S. Cl. 214—621 **3 Claims**



A load lifting attachment for use with a fork lift truck for lifting container loads from above, comprising a horizontal main frame having at one or both ends an extension slidable longitudinally with respect to the frame, locking means for retaining the extensions in the frame, power operated means for moving the extension into and out of the frame, load engaging means at the corners of the extensions, a pair of translatable fork elements on the main frame and engageable by the forks, power operated means for moving the frame with respect to said forks.

3,713,557

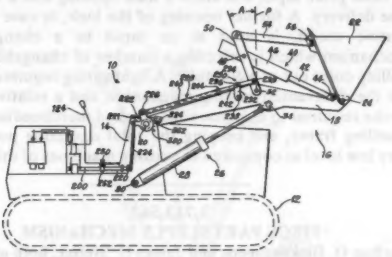
METHOD AND APPARATUS FOR POSITIONING BUCKET LOADER

David H. Seaberg, Burlington, and Paul J. Purdy, New London, both of Iowa, assignors to J. I. Case Company

Filed July 27, 1970, Ser. No. 58,588
Int. Cl. B66f 9/00
U.S. Cl. 214—763 **25 Claims**

A bucket loader having pivotally mounted lift arms with a bucket pivoted on the free end of the lift arms by motor means actuated in opposite directions through a control valve. The control valve is actuated in either direction in response to (1) automatic sensing means for maintaining a predetermined angular relation relative to a fixed reference plane and (2) actuation of a manual control lever in either direction from a neutral position. The automatic sensing means incorporates mechanism for changing the control angle of the bucket relative to the fixed reference plane when the valve is controlled by the lever and thereafter maintaining the bucket at the new control angle. The mechanism further includes interlocking means between the manual control and the automatic sensing

control when the bucket is pivoted to a maximum roll-back position to neutralize the control means and mechanism for



rendering the sensing means inoperative when the lift arms are lowered beyond a desired lowermost position.

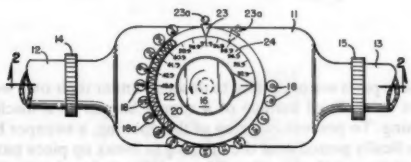
ERRATUM

For Class 215—56 see:
Patent No. 3,713,545

3,713,558
FLOW METER WITH EXTENSIBLE SCALE

R. Dean Pech, Box 284, Route No. 1, Clarksville, Mich.

Filed Sept. 13, 1971, Ser. No. 179,999
Int. Cl. B67d 5/30
U.S. Cl. 222—20 10 Claims



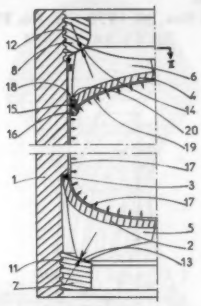
The specification discloses a liquid metering and dispensing attachment for dispensing given amounts of fluid when the unit price varies. The amount of flow in value as measured in dollars and cents is translated into degrees of rotation by means of an extensible and retractable computing means. The flow of liquid through the device spins a turbine and the amount of liquid dispensed is also translated thereby into degrees of rotation. When the two are equal, a snap action valve is released thereby shutting off the flow of liquid.

3,713,559
CYLINDRICAL VESSEL ADAPTED TO BE SUBJECTED TO INTERNAL PRESSURE

Georges Thillet, Grenoble, France, assignor to B. V. S., Grenoble, France

Filed Feb. 2, 1971, Ser. No. 111,816
Int. Cl. F25j
U.S. Cl. 220—3 7 Claims

A cylindrical vessel adapted to be subjected to internal pressure comprising a cylindrical member and two end closures, the end closures being concave with respect to the vessel interior and each being supported by a bearing member contacting substantially the whole of the exterior of the closure, each bearing member contacting a surface of a retaining member secured to the cylindrical member such that the resultant of the pressures exerted on a sectoral element of the bearing member has the same line of action as the reaction forces at

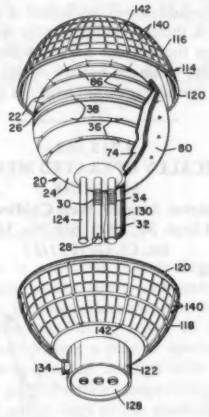


the surface of contact of that sectoral element of the bearing member with a corresponding sectoral element of the retaining member.

3,713,560
SPACED WALL CONTAINER

Paul Slysh, San Diego, and Edward J. Hujsak, La Jolla, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed April 19, 1971, Ser. No. 134,994
Int. Cl. B65d 25/04
U.S. Cl. 220—15 10 Claims

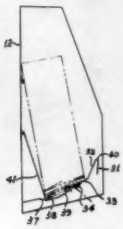


A spaced wall container having an inner wall for containment of fuels, cryogenic liquids, and the like spaced from, and connected to, an outer structure by a plurality of tension members to create steady-state stabilizing forces on the outer structure by utilization of the radial and tangential stiffness of the pressurized inner wall. The tension members are spring-biased to ensure tension loading under all conditions. Insulation material is mounted on the tension members between the inner wall and outer structure. Protection against fluid leakage into the insulation material is afforded by a shield interposed between the inner wall and the insulation. The outer structure forms a protective enclosure for the inner wall container in addition to forming the external wall of a Dewar flask when the void between the spaced walls is evacuated.

3,713,561
CABINET FOR SELECTIVELY DISPENSING DIFFERENT TYPES OF PAPER TOWELS

Gerald Willis Wyant, 4343 Mayfair Avenue, Montreal, Quebec, Canada

Filed Nov. 30, 1970, Ser. No. 93,621
Int. Cl. A47k *10/34*
U.S. Cl. 221—44 **7 Claims**

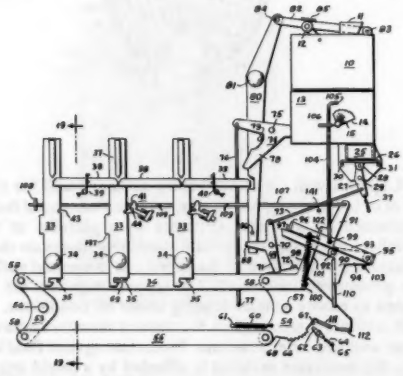


A paper towel dispensing cabinet of improved design is described for holding and dispensing rolled paper towels and single-fold, multi-fold and C-fold towels. The novel cabinet comprises a casing having a rear wall, a pair of side walls, a bottom member and a front wall, said bottom member including a substantially horizontal portion merging into an upwardly inclined portion towards the front of the casing, said inclined portion terminating in a substantially vertical rolled paper guide spaced rearwardly from the front wall, a folded towel dispensing slot in the inclined portion of the bottom, said slot being narrow adjacent the ends thereof and being enlarged rearwardly in the central region thereof to form a space for grasping C-fold towels and an adaptor plate hingedly mounted on the rear wall arranged to assume a first position flat against the rear wall to accommodate a towel roll or a wide width single-fold towel pack and a second position in which the plate is inclined downwardly with the lower edge thereof resting on the bottom adjacent the rearward edge of the dispensing slot to guide narrow width multi-fold and C-fold towel packs into engagement with the dispensing slot.

3,713,562
MECHANICALLY OPERATED MERCHANDISE MACHINE

Leo Kull, 58 Westover Avenue, West Caldwell, N.J.

Filed Sept. 30, 1971, Ser. No. 185,151
Int. Cl. G07f *11/22*
U.S. Cl. 221—125 **18 Claims**

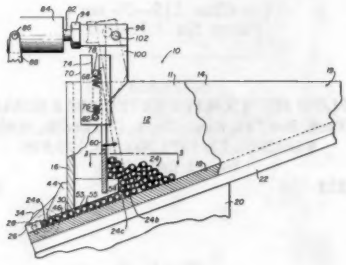


A mechanically operated coin controlled merchandising machine requiring a relatively light operating power. An operating bar is actuating directly a differential control mechanism which is performing a simultaneous sensing action to two incremental inputs which are a credit information and a vend price information. A sufficient credit input as compared to vend price input will allow a lock opening and a merchandise delivery. A further opening of the lock, in case of an excessive credit, is used as an input to a changemaking mechanism which is selecting a number of changeblades and pulling coins out of a cointube. A light spring required to actuate the differential sensing mechanism and a relatively short stroke required to dispense solid stacked merchandise, using a shuttling frame, are keeping the total operating power to a very low level as compared to existing machines of this kind.

3,713,563
PIECE PART SUPPLY MECHANISM

Carlton O. Dickensheets, and James G. Steizer, both of Dayton, Ohio, assignors to The Globe Tool and Engineering Company, Dayton, Ohio

Filed March 30, 1971, Ser. No. 129,351
Int. Cl. B65h *3/62*
U.S. Cl. 221—205 **8 Claims**



Piece parts are permitted to descend under their own weight down an inclined surface of a supply hopper to a discharge opening. To prevent clogging of the opening, a sweeper blade is cyclically passed over the opening to break up piece part accumulation at the opening. Piece parts passing the discharge opening enter a discharge chute which guides the piece parts in seriatum to an ejection station. Power delivered to the ejection station also cycles the sweeper blade to synchronize sweeper blade operation with the demand for piece parts. Bias means associated with the sweeper blade mounting yield to prevent damage to piece parts should the sweeper blade become jammed against piece parts.

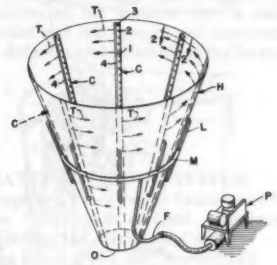
3,713,564
METHOD AND MEANS FOR FACILITATING THE FLOW OF GRANULAR MATERIALS

Lyle F. Cottrell, Salina, Kans., assignor to Butler Manufacturing Company, Kansas City, Mo.

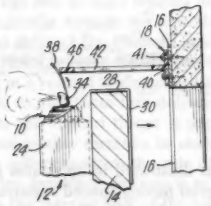
Filed June 25, 1971, Ser. No. 156,685
Int. Cl. B65g *3/12*
U.S. Cl. 222—1 **10 Claims**

A method of and means for facilitating the discharge of granular or powdery material, especially irregularly shaped particles of granular material, from a conically shaped hopper or cylindrically shaped container such as a storage bin, in which a plurality of circumferentially spaced, co-directed flat streams of compressed air are introduced into the hopper or bin portion and directed to flow thereinto approximately tangentially of the wall surface thereof, with at least some of such streams being coextensive in height with the height of such wall surface so as to form a hopper lining film of compressed

air between the arch basing area of such wall surface and the wall opposing surface of the mass of material in such hopper portion that will impart a centrifugally directed agitating effect on the mass of material while also imparting a moment of force acting inwards of the wall surface due to the expansion of the film of compressed air between the wall and the wall opposing surface of the mass of material.



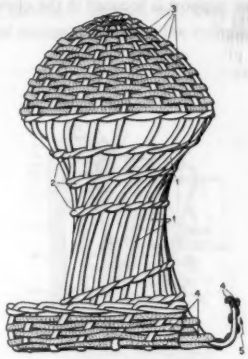
3,713,565
AEROSOL SPRAY ACTUATING DEVICE
Donald Campbell Langford, Oakland Avenue, Hudson Heights, Quebec, Canada
Filed May 12, 1971, Ser. No. 142,687
Int. Cl. B65d *83/14*
U.S. Cl. 222—180 **4 Claims**



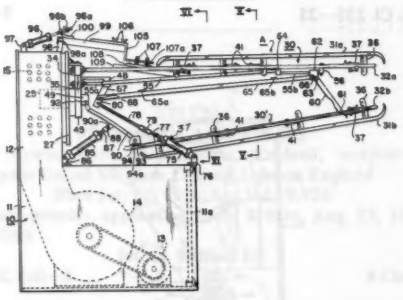
A device for operating an aerosol can having a tilting lever valve including a lever extension mounted to the valve, the can being supported on the edge of the door while the tripping mechanism is provided in alignment with the extension of the valve mounted to a door frame adapted to actuate the lever as the door is being opened and closed.

3,713,566
WIG STAND
Carmen Perez Perez, Carrera de San Jeronimo 18, Madrid, Spain
Filed July 27, 1971, Ser. No. 166,450
Claims priority, application Spain, June 18, 1971, 170.081
Int. Cl. D06c *15/00*
U.S. Cl. 223—66 **1 Claim**

A wig stand having deformable stems with a rounded, sinuous body collapsible by torsion. A cord is wrapped in a spiral on the stems. A plurality of plastic bands or tubes form the upper part of the stand by interweaving with the stems forming the generatrix. The lower part of the stand is pushed upward to form a vertical annular flap for receiving and partially concealing the upper portion when folding of the stand is achieved by torsion.



3,713,567
PANTS PRESSING APPARATUS
August F. Paris, 1415 McCullough Ave., Brockway, Pa.
Filed July 7, 1971, Ser. No. 160,476
Int. Cl. D06c *15/00*
U.S. Cl. 223—73 **24 Claims**



A pants presser is provided that is flexible and readily adaptable for pressing slacks, shorts and pants of various sizes, shapes and designs, including flared leg and bell bottom types. It uses a frame structure having a pair of upper and lower parts, with each part having a pair of spaced-apart creasing blades, each blade is adapted to align with a corresponding blade of the other part to define cooperating, side-positioned pairs for insertion within legs of the pantslike garment. One frame part and the blades carried thereby for collapsible and expandable with respect to the other part to enable the insertion, pressing and removal of a pair of pants, and each blade of the frame structure is adjustably mounted with respect to its frame part and has a central flexible portion for shape-conformance with respect to a pants leg.

3,713,568
CHILD CARRIER
James Sloan, Rochester, N.Y., assignor to Cross River Products, Inc., Briarcliff Manor, N.Y.
Filed Nov. 10, 1971, Ser. No. 197,307
Int. Cl. A61g *1/00*
U.S. Cl. 224—6 **6 Claims**

There is disclosed a child carrier of the "back-pack" type which facilitates placing of the child in the carrier and also al-

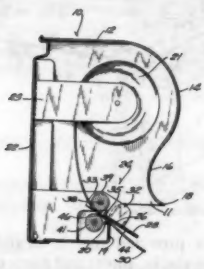
lows the carrier to function as a chair for the child. Attached to the single main frame of the unit there is a frame support which can be pivoted from a closed position to an open position. The frame support is secured in the closed position when

the device is worn and a child is carried by an adult such that the support is almost inconspicuous. But when opened, the support serves to rigidly support the carrier so that a child can be seated in it as it stands on the floor or on the ground without danger of tipping.

3,713,569
PAPER TOWEL DISPENSER

Merwin J. Dashnier, and James A. Diring, both of Green Bay, Wis., assignors to Alwin Manufacturing Company, Inc., Green Bay, Wis.

Filed Dec. 7, 1970, Ser. No. 95,522
Int. Cl. B26f *3/02*
U.S. Cl. 225—21 **3 Claims**



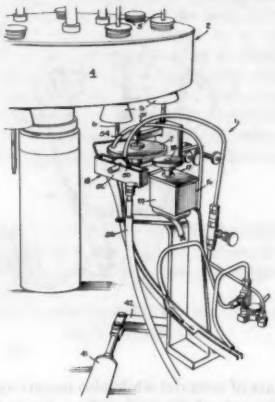
A dispenser for a supply roll of web material such as toweling includes a web rest for supporting the free end of a web in a convenient access position below a tear-off knife. A pivotally mounted floating web depresser in the dispenser outlet yieldably holds the web on the supporting web rest but pivots upwardly as the web is lifted and drawn against the tear-off knife. When a sheet is severed from the roll, the web depresser removes the web end from the knife and returns it to position on the web rest.

3,713,570
MEANS FOR CUTTING GLASS TUBES

Henry G. Heflich, Ridgefield, N.J., assignor to Kahle Engineering Co., Union City, N.J.

Filed Sept. 17, 1971, Ser. No. 181,477
Int. Cl. B26f *3/06*
U.S. Cl. 225—93.5 **10 Claims**

An improved means is disclosed for cutting glass tubes at a precise position and with an evenly cut end. The device may be used alone as a glass tube cutter or it may be incorporated in a larger glass forming machine at a separate tube cutting station. The tube cutter has a crack-off wheel rotatably mounted on an axis parallel to the axis of the glass tube being cut. This wheel has a capillary groove in its rim which holds a bead of water below a dry projecting wheel edge. The rotating

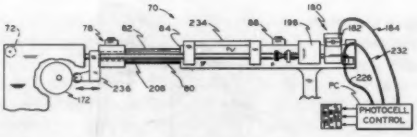


crack-off wheel brings the bead of water into contact with the heated glass tube resulting in a precisely positioned and even cut or crack-off of the glass tubing at the point contacted by the water bead.

3,713,571
METHOD AND APPARATUS FOR FEEDING STRIP MATERIAL

Robert D. Simonton, Fremont, Ohio, assignor to Dale Products, Inc., Fremont, Ohio

Filed May 18, 1971, Ser. No. 144,427
Int. Cl. B65h *23/18*
U.S. Cl. 226—2 **20 Claims**



The invention is illustrated in apparatus for intermittently feeding strip material having spaced registration mark means along the length thereof and for aligning the strip material in a station receiving the material. The strip of material is intermittently advanced into the station. Adjustable means are provided for regulating the length of advancement. Detecting means are provided to find a registration mark means on the strip material. After movement of the material has ceased the registration mark detecting means is moved relative to the material to enable detection of the actual location of a registration mark The actual location of a detected registration mark is compared with a desired location of the registration mark means and an indication of the difference between the actual and the desired locations is provided. When a difference between the actual and desired locations of a detected mark indicates that an advancement length adjustment is required, the adjustable means is adjusted to change the length of advancement of material. A difference between detected and desired locations which is in excess of a predetermined advancement regulation length may be sensed, and the operation of the advancing means may be interrupted in response to an excess length sensing. The difference between a detected location and a desired location may be classified in one of a plurality of the zones, each zone representing a predetermined range of differences. A predetermined magnitude of adjustment of the feeding stroke may be made in ac-

cordance with the zone in which the location differance is classified. Alternatively, an output signal may be provided which is proportional to the difference between a detected location and a desired location of a registration mark, and the adjustable means may be adjusted to change the advancement length of the advancing means in proportion thereto to enable correct advancement of the material into a station. Both reciprocating feeder and roll type or arc movement feeders are illustrated in different embodiments of the invention.

3,713,572

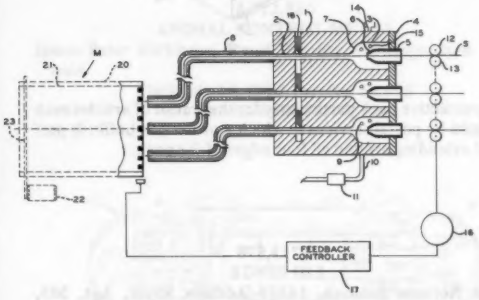
MATERIAL FEEDING SYSTEM

William B. Goldsworthy, Palos Verdes Estates, and Ethridge E. Hardesty, Pine Valley, both of Calif., assignors to Goldsworthy Engineering, Inc., Torrance, Calif.

Filed Feb. 3, 1971, Ser. No. 112,162

Int. Cl. B65h *25/06*

U.S. Cl. 226—7 **18 Claims**



A method and apparatus for feeding textile roving strands and the like through one or more feeding tubes by means of an air vehicle. The textile strands are introduced into filament guides and pulled through the filament guides by means of air under pressure. A discharge aperture on each of the filament guides is located in a venturi throat where air picks up the filament strands and carries them into delivery tubes. This same educted air from the venturi throat is used to transport the strands over considerable distance in such delivery tubes. A pair of metering rollers controls the rate of strand delivery to the filament guides. Inasmuch as there is an air boundary layer existing between the interior wall of the tube and the exterior wall of the glass, the abrading effect is very substantially reduced. A control mechanism regulates the operation of the metering rollers, and hence the feeding of the strands with respect to a demand on the strand. In addition, a second embodiment of the invention discloses a reciprocation of the feeding mechanism in timed relation to the metering of the strands through the feeding mechanism and in timed relation to the demand for the strands.

3,713,573

SAFETY DEVICE ON A COMPRESSED AIR-OPERATED DRIVE-IN APPARATUS TO DRIVE-IN FASTENERS

Hellmuth Fehrs, Hamburg, Germany, assignor to Jon. Friedrich Behrens, Ahrensburg, Germany

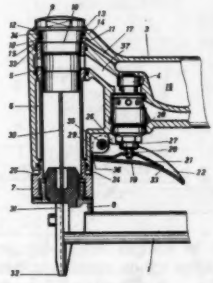
Filed Feb. 25, 1971, Ser. No. 118,857

Claims priority, application Germany, Feb. 28, 1970, P 20 09 455.7

Int. Cl. B25c *1/04*

U.S. Cl. 227—8 **10 Claims**

This apparatus comprises a housing, a cylinder having limited movement relative to the housing and a magazine for fasteners, attached to the cylinder and having a foot to engage a work piece and through which fasteners from the magazine are driven into the work piece. A piston in the cylinder has a plunger to drive fasteners through said foot. A valve means controls supply of compressed air to the cylinder to move the piston for driving a fastener. Manually actuable means, and means dependent on both movement of the cylinder when the foot is placed on the work piece, and on manual actuation of said manually actuated means, to actuate said valve means to supply compressed air to the cylinder to move said piston to drive a fastener.



3,713,574

PRESS TOOL ASSEMBLIES

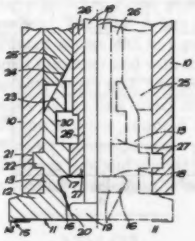
David Lewis, Ryton-on-Dunsmore, England, assignor to Chrysler United Kingdom Limited, London, England

Filed July 30, 1970, Ser. No. 59,724

Claims priority, application Great Britain, Aug. 13, 1969, 40,372/69

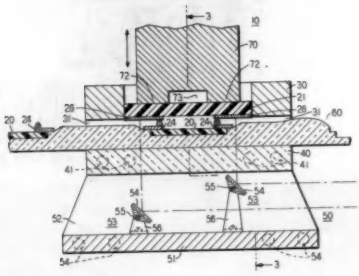
Int. Cl. B23k *21/00*

U.S. Cl. 228—3 **8 Claims**



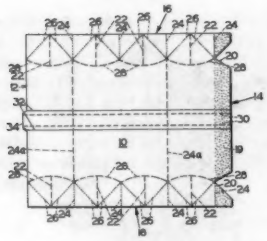
A press tool assembly comprises a tool holder for mounting on a press mechanism at one end with an axis of the holder extending in the direction of operation of the press mechanism and a plurality of tools mounted at the other end for radial movement towards and away from the axis of the holder.

3,713,575
BONDING APPARATUS HAVING MEANS FOR CONTINUOUS MONITORING OF THE BOND
Robert Holbrook Cushman, Huntingdon Valley, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed June 29, 1971, Ser. No. 157,959
Int. Cl. B23k *1/00*
U.S. Cl. 228—6 8 Claims



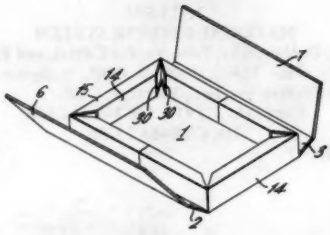
Bonding apparatus is disclosed in which a housing and ram are combined with a transparent pressure plate, a transparent device carrier and an optical arrangement for continuously monitoring the parts during the bonding operation.

3,713,576
CYLINDRICAL CARTON
Henry R. Goebel, Ventura, Calif., assignor to Western Krarft Corporation, Portland, Oreg.
Filed Dec. 28, 1970, Ser. No. 101,665
Int. Cl. B65d *3/04*
U.S. Cl. 229—21 3 Claims



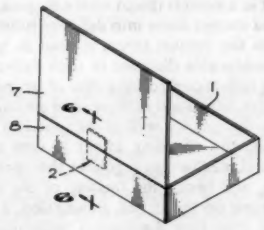
A cylindrical carton is made from a folded sheet of flexibly stiff carton material. It comprises a body having opposite side and end margins. The body is flexed into cylindrical form with the opposite side margins overlapped and secured. At least one end margin is scored and folded into a plurality of triangular end sections which may be reversely folded inwardly of the cylinder to abut the sections against each other in mutually braced relation, thereby forming a self-sustaining end closure for the carton.

3,713,577
PROTECTIVE PACKS
Derick Charles Skinner, Somerset, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Feb. 1, 1971, Ser. No. 111,293
Claims priority, application Great Britain, Feb. 6, 1970, 5,740/70
Int. Cl. B65d *5/06*
U.S. Cl. 229—33 4 Claims



A protective pack particularly for the transit of articles such as books by postal services in which a protective buffer is provided extending around all four edges of the pack.

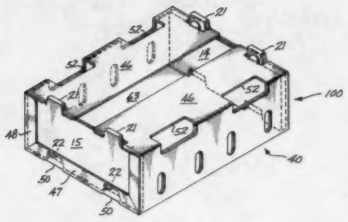
3,713,578
LID HINGE
Glenn Norman Johnson, 14359 Addison Street, Apt. 303, Sherman Oaks, Calif.
Filed March 2, 1971, Ser. No. 120,094
Int. Cl. B65d *13/04*
U.S. Cl. 229—44 M 6 Claims



The invention involves the use of a flat piece of flexible metal attached to both the lid and side of a container to enable one to raise the lid to a preselected position and have the lid remain in such position until a change in position is desired.

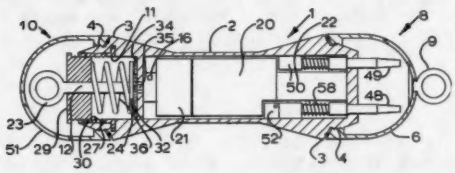
3,713,579
CONTAINER WITH MEANS FOR LOCKING THE LID
John W. Chaffers, Modesto, Calif., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed March 12, 1971, Ser. No. 123,636
Int. Cl. B65d *5/32*
U.S. Cl. 229—44 R 3 Claims
A container having means for easily locking and unlocking the lid of the container. The lid sits on a ledge of the container

body. A side wall of the container body extends above the lid and has a relief which extends above the lid also. A locking tab



on the lid extends upwardly into the aperture and frictionally engages the upper edge and back of the relief to lock the lid in place. The tab may be pulled from the relief to unlock the lid.

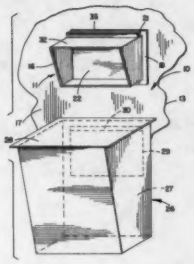
3,713,580
ANIMAL CONTROL MEANS
James Peter Mickleson, Rural Delivery, Owhanga, New Zealand
Filed July 14, 1970, Ser. No. 54,695
Int. Cl. B68b *11/00*
U.S. Cl. 231—2 E **4 Claims**



An animal control means consisting of a unit incorporating a mechanism capable of actuating an electric fence and a mechanism for use as an animal prodder. The control means is incorporated into a substantially cylindrical, small and portable container with the electric fence actuating mechanism at one end and the animal prodder mechanism at the other end. Both ends have switching mechanisms which are in circuit with a battery and a pulse generating unit. The electric fence mechanism has a normally outwardly urged shaft to which fence wire may be attached and the animal prodder at least one inwardly urged pin member, both being urged to their positions of rest by springs. Furthermore, they are located within insulated casings and are associated therein with switch mechanisms, such that pressure being applied to the shaft or pin, against the urging of the spring, will cause the shaft or pin to slide within the casing and to actuate the switch mechanisms and to thereby become electrified, thereby electrifying fence wire attached to the electric fence end of the unit or an animal touched with the pin of the animal prodder end of the unit. The unit is also capable of being operated by a manual switch.

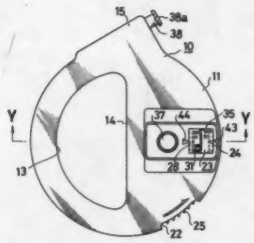
3,713,581
RUBBISH DISPOSAL DEVICE
George O. Mullens, 18202 Coltman Avenue, Gardena, Calif.
Filed March 19, 1971, Ser. No. 126,172
Int. Cl. B65f *1/00*
U.S. Cl. 232—1 E **8 Claims**

A rubbish disposal device including a chute extending through a wall so as to leave a small portion having a flat upper surface projecting on the outside of the wall, the chute having a spring-loaded door normally closed. A rubbish container fits on the outside of the wall, having an opening receiving the projecting portion of the chute, being suspended from the



chute by resting on the upper surface of the chute, and retained on the chute by a flange on the upper surface of the chute spaced from the outer wall surface.

3,713,582
COUNTER
Hideto Furuoka, Tokyo, Japan, assignor to Gakken Co., Ltd., Tokyo, Japan
Filed April 29, 1971, Ser. No. 138,452
Int. Cl. G06c *27/00*
U.S. Cl. 235—116 **6 Claims**

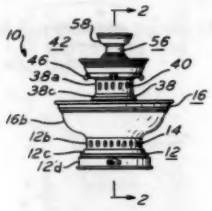


A flat, substantially circular case houses a first rotary dial of comparatively large diameter, which is substantially in the form of a ratchet wheel, and a second rotary dial of comparatively small diameter which has a gear portion formed coaxially on its back surface. The first rotary dial is rotated by means of a click secured at one end to a partly exposed push button and engaged at the other end with the teeth formed on the periphery of the first rotary dial. The second rotary dial is actuated intermittently by the first rotary dial through gearing in order to register the number counted by each complete rotation of the latter. An indication made combinedly by the numerals marked on these first and second rotary dials can be observed through a window formed in the case.

3,713,583
BEVERAGE FOUNTAIN STRUCTURE
Alvin Gruber, 2215 Disston Street, Philadelphia, Pa.
Filed Sept. 17, 1970, Ser. No. 73,003
Int. Cl. B05b *17/08*
U.S. Cl. 239—17 **10 Claims**

A beverage fountain including a plurality of bowls mounted in spaced relation one above the other. The bowls are of decreasing size with the bottommost bowl being the largest. Means is provided for pumping a beverage from the bottommost bowl to the topmost bowl and each of the bowls above

the bottommost bowl has means for allowing the beverage to flow in streams from its sides to the next lower bowl to form a



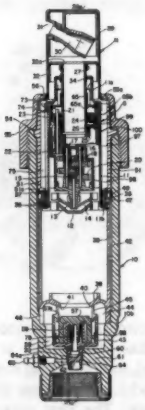
fountain of the beverage. The fountain includes means for preventing the beverage from splashing as it is pumped into the topmost bowl.

3,713,584

POWERED SPRINKLER

Edwin J. Hunter, Riverside, Calif., assignor to Toro Manufacturing Corporation, Minneapolis, Minn.

Filed Feb. 16, 1971, Ser. No. 115,599
Int. Cl. B05b 3/04
U.S. Cl. 239—206 **21 Claims**



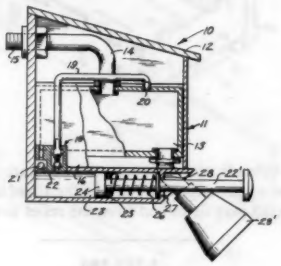
A rotary pop-up underground sprinkler which utilizes a self-contained integrated gear case and nozzle section and a valve-in-head concept with a reverse flow valve. The entire gear case and nozzle assembly act as the piston of a hydraulic cylinder. When the reverse flow valve opens, hydraulic pressure builds up within the case and the area differential causes the piston to move upwardly. To retract the head, the reverse flow valve closes, dropping the pressure to atmospheric below the piston seal, and the high pressure from below the valve seat is directed through a communication tube to a point higher than the piston seal when the piston is fully extended, thereby hydraulically forcing or driving the gear case and nozzle assembly downwardly to its retracted position with the hydraulic pressure continuing when the sprinkler is fully retracted to hold the sprinkler in retracted position by hydraulic pressure. As an alternate form, the retraction power is provided by a spring. The entire valve is removable from the top, including the valve seat and the screening system protecting the valve.

3,713,585

COMBINATION SHOWER AND TOILETRY DISPENSER

Alvin R. Conklin, 317 State Ave., Faribault, Minn.

Filed Sept. 7, 1971, Ser. No. 178,218
Int. Cl. B05b 7/32, 9/00
U.S. Cl. 239—307 **5 Claims**



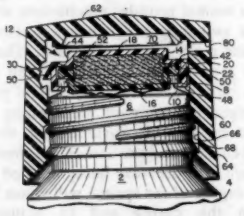
A dispenser device that will replace the common shower head within a shower stall. This device includes, primarily, pushbutton valve means for urging a liquid soap into a water mixing chamber and has check valve means for controlling the flow of the liquid soap. A second pushbutton valve of the device enables the user to deliver liquid soap into the hand when desired, prior to turning the water on.

3,713,586

FOAM PRODUCING AND DISPENSING CONTAINER

Milo E. Webster, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.

Filed March 29, 1971, Ser. No. 128,697
Int. Cl. B05b 11/00
U.S. Cl. 239—326 **10 Claims**

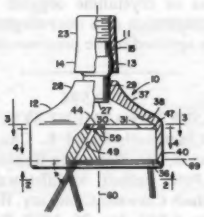


A container for dispensing fluid contained therein as a foam, the container having a deformable wall, a spout portion having external threads, a fitment attached to the spout and retaining a porous element, and a cap member threadedly attached to the spout and having an outlet orifice therein, the cap being rotatable to a first position in which communication between the porous element and the outlet orifice is interrupted and a second position in which communication between the porous element and the outlet orifice is open. The fitment and porous element are so arranged within the spout that fluid dispensed from the container and air simultaneously pass through the porous element where they are mixed prior to being dispensed as a foam.

3,713,587
SHOWER HEAD

William S. Carson, 200 St. Andrews Blvd., Apt. 3704, Winter Park, Fla.

Continuation-in-part of Ser. No. 41,950, June 1, 1970, abandoned. This application July 22, 1971, Ser. No. 165,096
Int. Cl. B05b 1/08
U.S. Cl. 239—383 5 Claims

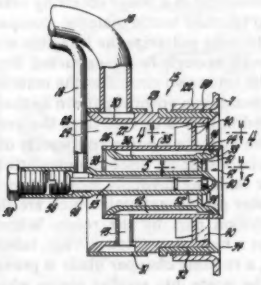


A shower head has a body portion rotatably mounted on a fitting adapted for connection with a pressurized source of water. The body portion is structured to provide three separate flow channels that project different types of streams including an oblique stream causing rotation of the body portion and a generally helically projected pattern that provides a massaging action on the bather, the body portion being equipped with relatively movable members that provide a valving action for selecting the desired flow channel and resulting stream form projected.

3,713,588
LIQUID FUEL SPRAY NOZZLES WITH AIR ATOMIZATION

Cecil H. Sharpe, Brownsburg, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1970, Ser. No. 93,369
Int. Cl. B05b 7/00
U.S. Cl. 239—400 4 Claims

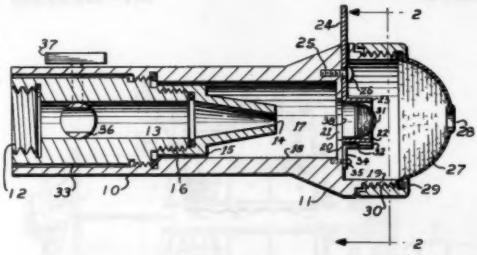


Fuel spray nozzles particularly suited for gas turbine combustion apparatus have inner and outer walls providing between them an annular passage for combustion air into the combustion chamber. Swirl vanes in the passage cause the air to take on a substantial tangential velocity so that it is discharged in a conical form into the combustion chamber. The fuel is injected into the passage at its outlet from a ring of ports in either the inner or outer wall of the passage so that it is atomized by and carried away with the air. The nozzles also include a pilot nozzle mounted within the inner wall and provide a second air entrance within the interior of the inner wall. Swirl vanes may be provided to swirl the air entering through the inner passage.

3,713,589
FOG NOZZLE

Hugh Noel McNair, Box 761, Fruitland Park, Fla., and Stuart William Olson, 3111 68 S.W. 34th St., Gainsville, Fla.

Filed Nov. 12, 1970, Ser. No. 88,666
Int. Cl. B05b 1/30
U.S. Cl. 239—575 5 Claims



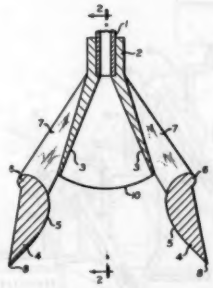
The present invention comprises an improved fog nozzle consisting of a nozzle with a pair of generally concentric screens, wherein the screens have means for diffusing and dispersing a water jet to form a dense essentially uniform fog of predetermined pattern, the outer screen having an aperture therein of a diameter sufficient to let a solid water jet pass through and the means of entirely removing the inner screen from the path of the water being discharged by the nozzle. The fog nozzle is designed to generate water fog at low pressures and with the minimum amount of entrapped air.

Means may be provided to reduce the discharge of water from the nozzle at any given pressure in order to maintain a desired pressure when necessary.

3,713,590
APPARATUS FOR SPREADING FILAMENTS

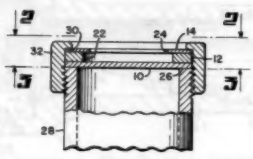
Oskar Dorschner, Bad Homburg; Cristoph Storkebaum, Egelsbach; Franz Josef Carduck, Bergen-Enkheim, and Johannes Janfeld, Kahl am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 16, 1970, Ser. No. 55,327
Claims priority, application Germany, July 17, 1969, P 19 36 354.3
Int. Cl. B05b 1/00
U.S. Cl. 239—597 8 Claims



Apparatus and process are provided for spreading continuous filaments entrained in a stream of air flowing from a high velocity air gun. The filaments are spread in a separator having a generally round inlet in communication with the outlet of the air gun which progressively changes in shape to a generally slot shaped outlet equal to or up to 10 times larger in size than the inlet, the longer sides of the slot being from 2 to 300 times greater in length than the shorter sides of the slot. To obtain further spreading of the filaments, generally parallel laterally extending spreaders are positioned adjacent the ends of the outlet slot of the separator and at right angles thereto.

3,713,591
SIMPLIFIED FLAT SPRAY NOZZLE
Sidney C. Watkins, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Oct. 1, 1971, Ser. No. 185,787
Int. Cl. B05b *1/04*
U.S. Cl. 239—590.3 8 Claims

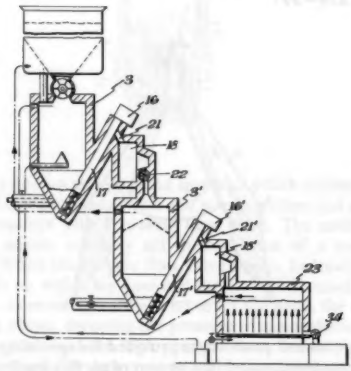


The disclosure illustrates a nozzle assembly comprising inlet and outlet plates stacked on either side of a spacer sleeve. The outlet plate has an elongated slot and the inlet plate has a pair of ports offset from and on opposite sides of the slot to promote turbulence within the spacer sleeve. The outlet plate may be made of flexible material so that for higher flow rates the plate deforms and provides a larger opening.

ERRATUM

For Class 241—260 see:
Patent No. 3,713,469

3,713,592
PROCESS AND APPARATUS FOR THE FINE COMMINUTION OF SOLIDS
Hans Beike, 15 Danzigen Weg, Kronberg/Taunus, Germany
Continuation-in-part of Ser. No. 786,179, Dec. 23, 1968, Pat. No. 3,614,001.
Filed Oct. 1, 1970, Ser. No. 77,074
Int. Cl. B02c *23/00*
U.S. Cl. 241—17 3 Claims

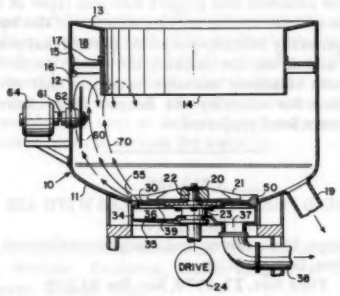


A process for the fine comminution of solids made brittle by their immersion into a cold liquefied gas is characterized in that all of the cold material comminuted after its cooling down to the temperature of the liquefied cooling gas is subjected to at least one further pass of comminution relaying mainly on the pressure effects for causing the average particle size of the materials to be considerably reduced.

3,713,593
FINE MEDIA MILLING PROCESS
Horton Harold Morris, Macon, Ga.; J. Raymond McMahan, Belmont, and William I. Rogers, Carlisle, both of Mass., assignors to Freeport Sulphur Company, New York, N.Y.
Filed Aug. 11, 1970, Ser. No. 63,001
Int. Cl. B02c *17/16*
U.S. Cl. 241—27 7 Claims

The invention relates to a process for the fine media milling of microorganisms or crystalline organic materials. In our process, a liquid dispersion of a microorganism or crystalline organic material is agitated in the presence of grinding media.

3,713,594
WASTE TREATMENT SYSTEM
Earl T. Blakley, Cincinnati; David E. Chupka, Middletown; Donald L. Harbron, Jr., Wisconsin Rapids; Paul G. Marsh, Hamilton, and Peter Seifert, Middletown, all of Ohio, assignors to The Black Clawson Company, Hamilton, Ohio
Division of Ser. Nos. 6,041, Jan. 26, 1970, Pat. No. 3,549,092, and Ser. No. 861,778, Sept. 28, 1969, Pat. No. 3,595,488. This application June 10, 1971, Ser. No. 151,762
Int. Cl. B02c *13/16*
U.S. Cl. 241—46.08 14 Claims

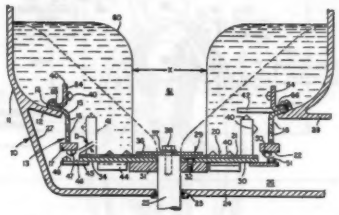


A waste treatment system which is capable of handling materials of widely different physical characteristics such as glass, metal, and fibrous and plastic waste, incorporates a rotor rotatably mounted in a waste receiving vessel, the rotor being adapted to fracture brittle material, compact malleable material, and otherwise pulverize the frangible waste to a particulate form small enough to be extracted through a perforated plate. The rotor also circulates the material in a slurry form within the vessel in a vortical pattern so that the waste is repeatedly treated until it is ejected from the vessel. A series of spaced attrition bars are mounted outwardly of the rotor to provide an annularly shaped, discontinuous attrition surface, and hammers or flails are pivotally mounted on the rotor to reduce into smaller pieces materials which are flung upon or between the attrition bars by the rotor. Where the waste material contains a high proportion of rags, tubing and other stringy material, a rotating chopper blade is provided to chop this portion of the waste into smaller pieces which are more readily handled by the rotor and flails. Waste materials which are not readily reduced to a pulverized state by the system are segregated from those which are and removed separately.

3,713,595
PULPING APPARATUS
Sam N. Craig, Devon, Pa.; Ellis R. Warner, Jr., West Chester, Pa., and Wayne T. Buckman, Pipersville, Pa., assignors to Wascon Systems, Inc., Hatboro, Pa.
Filed Aug. 6, 1970, Ser. No. 61,608
Int. Cl. B02c *13/18*
U.S. Cl. 241—46.11 18 Claims

A pulping tank is provided, for the pulping of solid debris in a liquid medium, with a rotating impeller being used to impel

liquid and sized particles outwardly through a sizing ring, with the impeller carrying means for cutting debris into desirably sized particles, and with the impeller being positioned at the lower end of the sizing ring in such a manner as to control an opening therebetween, for the passage of particles



therethrough, into contact with cutting teeth. The cutters may be applied to the impeller plate by any of several techniques, as for example by being removably secured thereto. Also, certain tank designs facilitate the formation of especially desirable vortex arrangements of a slurry being pulped, during rotation of the impeller at desired speeds.

3,713,596

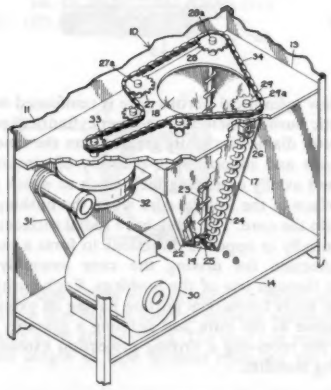
BOTTLE CRUSHING APPARATUS

William D. Hoffmann, Elkhorn, Wis., assignor to Mannorth Service Corporation, Elkhorn, Wis.

Filed Aug. 9, 1971, Ser. No. 170,070

Int. Cl. B02c *19/14*

U.S. Cl. 241—99 **2 Claims**



A force fed glass crushing device having a downwardly tapered housing with an inlet in the top end thereof for receiving glass objects, and a bottom outlet for discharging crushed glass. A plurality of substantially upright power driven screw augers are rotatably mounted within the housing and converge downwardly into close proximity with one another at their lower ends for crushing glass therebetween. The operation of the augers may be controlled by a switch automatically activited by glass objects prior to entering the housing and an automatic timed shutoff.

3,713,597

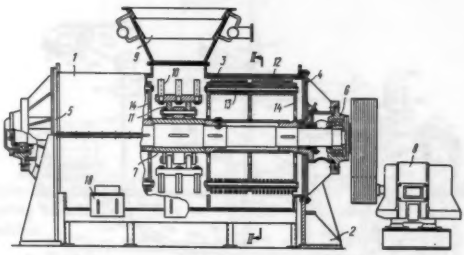
DEVICE FOR WET DISINTEGRATION

Alexandr Stepanovich Sladkov, Apatity Murmanskoi Oblasti, U.S.S.R., assignor to Gornometallurgichesky Institut Kolskogo Filliala, Akademii Nauk, U.S.S.R.

Filed July 24, 1970, Ser. No. 58,055

Int. Cl. B02c *13/06, 4/26*

U.S. Cl. 241—134 **2 Claims**



A device for the wet disintegration of materials of low and medium hardness, such as chalk clay, marl and so forth wherein a rotor with beaters is made so that it combines a crushing action with a milling action to achieve the required degree of fineness. For this purpose, the rotor is provided with hinged forked beaters centrally located on the rotor and bracketed by circular beaters alternately fluted and supported on axles spaced from the rotor axis.

3,713,598

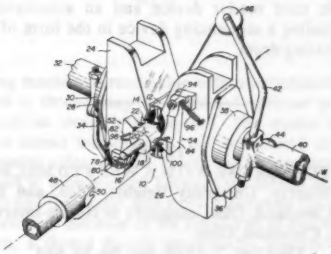
WIRE GUIDE APPARATUS

Glen E. Bucholtz, and James N. Doyle, both of Dayton, Ohio, assignors to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Jan. 13, 1971, Ser. No. 106,176

Int. Cl. H02k *15/09*

U.S. Cl. 242—7.05 B **5 Claims**



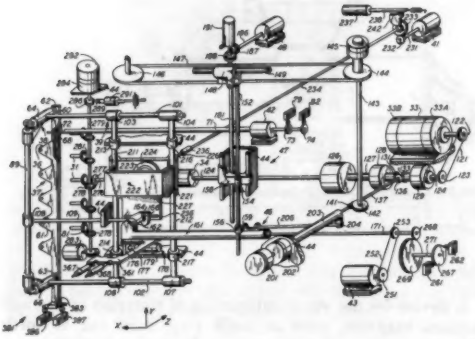
A double flier armature winding machine is provided with wire guides mounted upon the winding forms and cooperating with a shielding device to cause the wires used in winding the armature to be coursed over the proper commutator hooks.

Two embodiments are shown, one in which the wire guides are spring biased and one in which the wire guides are positively driven by mechanical means into straddling relation with the commutator hooks.

3,713,599
APPARATUS FOR DISTRIBUTING A STRAND

Norman F. Smith, Methuen, and Edward T. Stocker, Groveland, both of Mass., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed April 27, 1970, Ser. No. 31,890
Int. Cl. H01f 41/06, 41/10, 41/12
U.S. Cl. 242—7.11 16 Claims



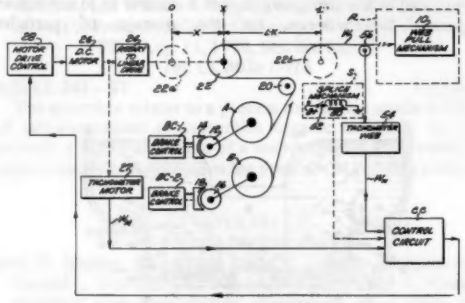
Apparatus for manufacturing multiple transformers simultaneously by winding several wire coils on bobbins and applying tape over each coil includes carriage mechanisms which are independently movable along three mutually perpendicular axes and orbitally about one of the axes. Separate drive mechanisms for each mode of movement include drive motors mounted on a stationary frame, thereby reducing the mass of the moving elements of the apparatus and permitting rapid changes in speed and direction of movements. Carriage-frame structural interlocks also provide low mass with rigidity to the carriage elements. A simple winding pitch adjusting mechanism, incorporating a drive lever with a variable pivot point, also forms part of the apparatus and also has a separate frame-mounted drive motor, as does a taping mechanism for applying tape over each wound coil. A group of bobbin-rotating spindles are connected to be driven by one of the frame-mounted carriage drive motors. The various mechanism of the apparatus are automatically operated in proper timed sequence according to programs provided for by a program-controllable card reader device and an automatic control system including a sequencing device in the form of a rotary, switch-actuating drum.

3,713,600
APPARATUS FOR USE WITH A WEB FED MECHANISM

James E. Murray, University Heights, Ohio, and Robert P. Kirsch, Cleveland, Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Dec. 7, 1970, Ser. No. 95,584
Int. Cl. B65h 19/14
U.S. Cl. 242—58.4 8 Claims

Apparatus is provided for use with a web fed mechanism, such as a printing press or a corrugating machine, which employs web pulling means to pull web to the mechanism from a web payout means, such as a roll of web material, at a relatively constant pull velocity. The apparatus includes a movable web guide which is positioned so as to be engaged by and for guiding directional movement of a web from a web payout means to the mechanism. The guide means is movable along a path so that when the payout velocity is less than the pull velocity the guide means moves along the path. Controllable retarding means is employed for use in applying retarding

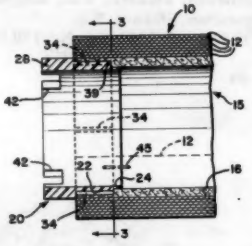


forces to the guide so as to decelerate movement thereof along the path. Control means serve to control the retarding means to control the rate at which the payout velocity increases.

3,713,601
CORE ASSEMBLY

Robert P. Buhrman, and Richard D. Hensley, Dayton, Ohio, assignors to Columbia-Great Lakes Corp., Dayton, Ohio

Filed April 13, 1970, Ser. No. 27,827
Int. Cl. B65h 75/02, 75/18
U.S. Cl. 242—68.6 2 Claims



A hollow cylindrical fibrous core is reinforced on each end by a plastic bushing including an inner cylindrical portion having an outer diameter slightly greater than the inner diameter of the core and supporting a plurality of circumferentially spaced and axially extending teeth each of which pierces the inner surface of the fibrous core when the bushing is pressed axially into the core. The teeth have radial surfaces facing circumferentially in opposite directions to form a positive non-slip connection for driving the core assembly in either direction through one of the bushings. Each bushing also includes an outer cylindrical portion having an external diameter the same as the core and defining a plurality of slots or recesses for receiving a driving projection extending from a supporting mandrel.

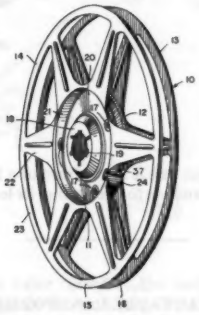
3,713,602
FILM REEL CLIP

Thomas Henry Patton, Niles, Ill., assignor to Compco Corporation, Chicago, Ill.

Filed Aug. 31, 1970, Ser. No. 68,144
Int. Cl. B65 75/28
U.S. Cl. 242—74 2 Claims

A film reel is provided with a film clip which adapts the reel for use either as an automatic take-up reel or a storage reel for either regular 8 mm. or super 8 mm. film. The film reel includes a central hub portion having a generally circular outer wall and a pair of spaced-apart side flanges extending radially

outwardly from the hub portion. The outer wall of the hub is provided with a slot which receives the central loop-shaped portion of the clip, and the clip also includes a pair of end portions which extend in generally opposite directions from the clip central portion substantially tangent to the outer wall of the hub portion. An arcuate prong extends generally radially outwardly from one of the end portions adjacent one of the side flanges of the reel, and the thickness of the prong and the spacing thereof from the side flange of the reel is such that the



prong can be received by sprocket opening of either regular 8 mm. film or super 8 mm. film. When the film is to be used as a take-up reel, the film is fed onto the central hub portion of the reel, and the prong passes through one of the sprocket openings of the film and winds the film about the reel. When the reel is to be used as a storage reel, the film is inserted into the looposhaped central portion of the clip which extends through the notch in the outer wall of the hub, and rotation of the reel winds the film about the hub portion.

3,713,603

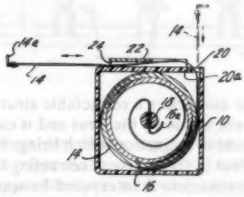
RETRACTABLE MEASURING TAPE

Sidney X. Shore, Roslyn, N.Y., assignor to Souvenir Pen and Pencil Company, Cedar Rapids, Iowa

Filed Nov. 30, 1971, Ser. No. 203,159

Int. Cl. B65h *75/48*; G01b *3/10*

U.S. Cl. 242—107.2 **7 Claims**



A measuring tape with a wind-up spring is equipped with an arresting device that can be used to prevent automatic wind-up. No moving parts are involved. The user can readily adjust the extended length of tape without releasing the arresting device.

3,713,604

SUPPORTING DEVICES

Keith Oliver Foley, Pontypool, Monmouthshire, England, assignor to Imperial Chemical Industries Limited, London, England

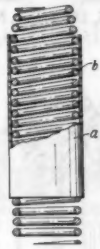
Filed Aug. 31, 1970, Ser. No. 68,122

Claims priority, application Great Britain, Sept. 15, 1969, 45,293/69

Int. Cl. B65h *75/10*

U.S. Cl. 242—118.2 **7 Claims**

A method and apparatus for minimizing the distortion that may occur in a hollow textile bobbin when such a bobbin having thermoplastic yarn wound thereon is subjected to condi-



tions likely to cause the yarn to contract, in which a helical spring mandrel that may be "wound-up" is inserted into the bobbin.

3,713,605

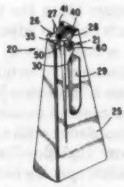
QUICK THREADING THREAD GUIDE FOR SEWING MACHINES

Erwin Vahle, Blankenloch, and Paul Senk, Karlsruhe, both of Germany, assignors to The Singer Company, New York, N.Y.

Filed Feb. 10, 1972, Ser. No. 225,058

Int. Cl. B65h *57/04*

U.S. Cl. 242—157 **3 Claims**



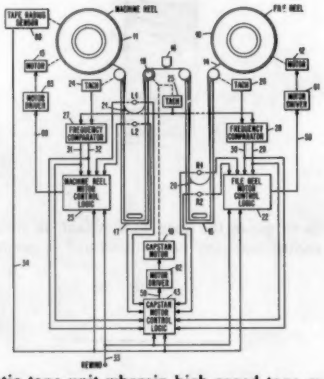
A sewing machine thread guide with a self-threading eyelet into which a thread may be admitted without passing the thread endwise through the eyelet. The eyelet is formed between a thread introduction "V" notch and an elongate slot. Opposite sides of the thread guide are intentionally forced apart to form a crack between the thread introduction "V" notch and the eyelet, and a crack between the eyelet and the elongate slot. Because of the angularity of the walls of the "V" notch, a thread forced downwardly therein will force open the crack leading to the eyelet for passage therethrough of the thread. Since the eyelet is rounded, a thread therein forced downwardly will not open the crack leading to the elongated slot, which serves only to augment the capacity of the cracked apart portion between the thread introductory "V" notch and the eyelet to flex apart to admit passage of the thread. A thread deflecting fin extending transversely across the path of thread through the eyelet not only imposes a light tension to thread directed through the eyelet, but also prevents any appreciable force from being applied by a thread in the eyelet along the crack which might unthread the eyelet.

3,713,606

MAGNETIC TAPE UNIT CAPSTAN AND REEL MOTOR CONTROL APPARATUS

Richard W. Van Pelt, and Allen J. Werner, both of Boulder, Colo., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,404
Int. Cl. G11b *15/58, 15/46;* B65h *23/18*
U.S. Cl. 242—184 14 Claims



A magnetic tape unit wherein high speed tape movement, for example bidirectional high speed search or unidirectional high speed rewind is achieved at the maximum possible tape speed by means of apparatus which controls the speed of the capstan in accordance with the speed of the slowest reel motor.

The magnetic tape unit includes a single capstan, a file reel, a machine reel, a file vacuum column disposed between the capstan and the file reel, and a machine vacuum column disposed between the capstan and the machine reel.

Each vacuum column includes two spaced sensors to divide the column into three zones. The sensors provide discrete outputs indicative of the zone position of the tape loop in each column.

Three digital tachometers sense the tape speed at the capstan and at the side of each column adjacent a reel. The output of each reel tachometer is continuously compared to the output of the capstan tachometer to originate a binary output signal have a "reel-fast" or a "reel-slow" state.

The reel motor and the capstan motor are controlled by (1) the column sensors in accordance with tape loop zone position and (2) the "reel-fast" or "reel-slow" signal, to run the capstan at its maximum possible speed when both reel motors are capable of moving the tape at this same speed, and to operate the capstan in a drive-coast mode if one or both of the reel motors are slow, the drive-coast mode then being controlled by the slowest reel motor.

At the end of the rewind, a machine reel radius sensor causes both reel motors to be placed in a brake mode, and the capstan motor to be placed in a coast mode. If one motor has a weak braking effect, the speed of this particular motor controls the capstan in a coast-drive mode and the other reel motor is placed in a brake-coast mode under control of this weaker motor.

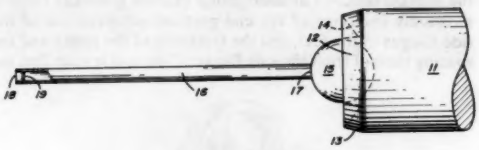
3,713,607

LOAD REDUCING SPIKE FOR SUPERSONIC MISSILES

Jacques A. F. Hill, Huckleberry Hill, and Richard H. Adams, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 15, 1968, Ser. No. 753,040
Int. Cl. F42b *15/00;* F41g *9/00, 11/00*
U.S. Cl. 244—3.1 5 Claims

A spike protected dome for supersonic bodies as a protective against rain erosion as well as reducing drag, aerodynamic, thermodynamic and structural loading. The spike is attached to the radome and is in the form of a hollow tube, open at the forward end and perforated along its length.

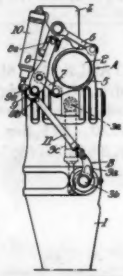


3,713,608

RETRACTABLE LANDING GEAR

Jacques Leclerco, Saint-leu-la-Foret, and Louis Reide, 92 Meudon, both of France, assignors to Societe Hispano-Suiza Lallemant, Bois-Colombes, France

Filed Jan. 20, 1971, Ser. No. 108,074
Claims priority, application France, Jan. 28, 1970, 7003047
Int. Cl. B64c *25/10*
U.S. Cl. 244—102 R 6 Claims



The landing gear comprises a retractable strut and at least one movable element borne by the strut and is capable of undergoing a movement of retraction which brings it close to the lifting axle of the strut in the course of retracting the said strut. A compensating mechanism is interposed between a zone of the main linkage and the auxiliary brace. The landing gear is suitable for aircraft of a certain weight.

3,713,609

AIRCRAFT ARRESTING GEAR

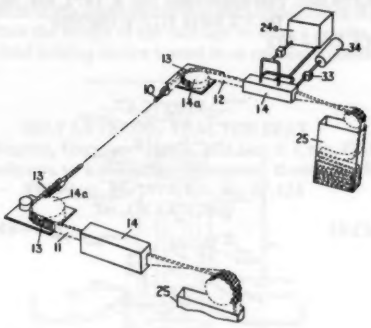
John Campbell Matthew, Lasswade, Scotland, assignor to Mactaggart, Scott & Company, Limited

Filed March 2, 1971, Ser. No. 120,195
Int. Cl. B64f *1/02*
U.S. Cl. 244—110 A 12 Claims

The invention consists in an aircraft arresting gear wherein a rope or net is stretched across a runway and is secured to power absorbing means located at each side of the runway.

Connected to each end of the rope or net is a belt having transverse teeth. Each belt is passed through a casing having inlet and outlet ports. Hydraulic fluid introduced through an inlet port fills the gaps between the teeth as the belt passes through the casing and means are provided by which such

fluid is displaced and discharged through the outlet port under pressure. Such means may be in the form of a tooth wheel which meshes with the teeth of the belt. The discharged fluid

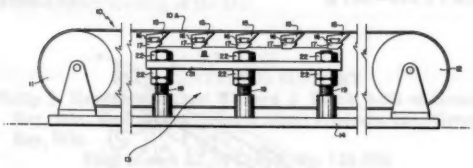


passes through a valve by which the outlet pressure can be controlled to regulate the retarding force applied to the belt. Such control regulates the retarding force applied to the aircraft being arrested.

3,713,610
MOUNTING MEANS FOR FOIL-TYPE AND SIMILAR ELEMENTS

John E. Grenier, Cherry Valley, Mass., assignor to Lodding Engineering Company, Auburn, Mass.

Division of Ser. No. 722,960, April 22, 1968. This application May 15, 1970, Ser. No. 48,666
Int. Cl. F16m *13/00*
U.S. Cl. 248—1 **9 Claims**



The disclosure describes a support for a stationary drainage element for a paper machine extending across the Fourdrinier wire. The support comprises a flaring tenon for a dovetail slide incorporating means to adjust the distance between the flaring walls. The drainage element has a mortise slot for cooperating with the slide. The flare of the slide is adjusted by means of an actuator mounted at one end of the support.

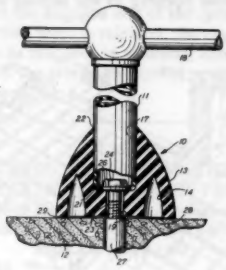
This abstract is intended neither to define the invention of the application, which is to be measured by the claims, nor in any way to be limiting as to the scope of the invention.

3,713,611
RESILIENT MOUNTS FOR SUPPORTING POSTS

William L. Voigt, Boxford, Mass., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 19, 1971, Ser. No. 116,756
Int. Cl. E04h *12/22*
U.S. Cl. 248—44 **3 Claims**

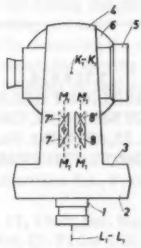
An impact absorbing block of resilient material is utilized as an intermediary to support a post on a base. The block has a bore extending therethrough with a shoulder formed therein to support (1) the post and (2) a fastener which extends from the bore to draw the block against the base. The bottom surface of the block is dished-out so that the drawing up of the fastener compresses the peripheral edge of the block against the base to provide a dust-free seal.



3,713,612
ANGLE-MEASURING INSTRUMENT

Wieland Feist; Peter Navratil, and Roman Seifert, all of Jena, Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Gera, Germany

Filed April 30, 1971, Ser. No. 141,053
Int. Cl. B23q *1/04*
U.S. Cl. 248—183 **1 Claim**



An angle-measuring instrument comprises a sighting device which is supported in two brackets for tilting about a first axis and which, together with said brackets, is rotatable about a second axis. Two double levers in close adjacency to one another are so mounted on one of said brackets that each said lever can be turned, over a mid-position, into two extreme positions. The mid-positions of said two levers are substantially parallel to one another. Said levers, in their one extreme positions, cause gears to impede rotation of the sighting device about the axes and, in their other extreme positions, release the sighting device for rotation. The close adjacency of said levers to one another facilitates their operation.

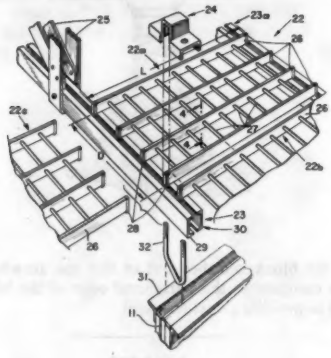
3,713,613
METHOD AND APPARATUS FOR RUNNING TELEPHONE CABLE

Charles E. Searls, Cypress, Calif., assignor to General Telephone Company of California

Filed Nov. 1, 1971, Ser. No. 194,620
Int. Cl. F16l *3/00*
U.S. Cl. 248—49 **2 Claims**

A grid structure is substituted for the conventional overhead cable racks for running cable between switch panels mounted on vertical bays in a central telephone office. The grid structure permits selected switch panels to be connected together by running a cable directly upwardly from a first switch panel, through a first opening in the grid structure,

thence horizontally along the top of the grid structure in a straight line direction to a second opening in the grid structure directly above a second switch panel, and directly down through the second opening to the second switch panel. By



this arrangement, point to point overhead straight line connections can be made rather than having to run the cable along the assigned paths as was the case with the old type cable racks all to the end that substantial savings in man hours and cable costs result.

3,713,614

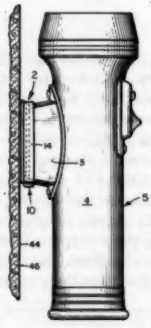
FLASHLIGHT HOLDER

Eustace H. Taylor, 1320 Sommerset, Glenview, Ill.

Filed Dec. 23, 1970, Ser. No. 100,866

Int. Cl. F21l *15/16*

U.S. Cl. 248—205 A **7 Claims**



A holder for a flashlight and the like comprising a permanent magnet on the flashlight body and a magnetically attractable bracket having a base with a resilient pad and having an adhesive backing adapted to adhere the bracket, preferably in an upright position, to an associated support structure, the bracket having a peripheral flange along its upright lateral sides and along its bottom edge guiding the magnet and preventing it from gravitating out of the bracket from vibrations ungendered in the supporting structure which may be the frame of an automobile. The pad serves to absorb contact shocks to preserve the magnet and to absorb vibrations.

3,713,615

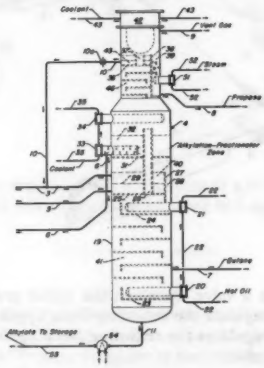
ALKYLATION-FRACTIONATOR

Edwin K. Jones, Kenilworth, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 830,344, June 4, 1969, Pat. No. 3,579,603. This application Jan. 8, 1971, Ser. No. 104,945

Int. Cl. B01d *3/22*; C10g *7/00*

U.S. Cl. 196—102 **6 Claims**



Alkylation-Fractionator having a settling section for separating liquid catalyst from the effluent of an alkylator. The lighter isoparaffins are stripped from the heavier fractions in a fractionation section below the acid settling section.

3,713,616

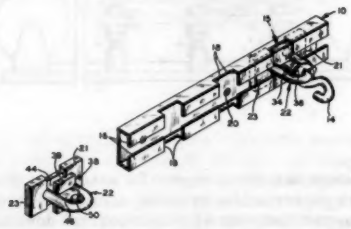
LOAD HOLDING DEVICE IMPROVEMENT

Thomas S. Bowers, 1301 Northwestern, Apt. 224, Lake Forest, Ill.

Filed March 5, 1971, Ser. No. 120,519

Int. Cl. B65j *1/22*

U.S. Cl. 248—361 R **10 Claims**



A guide rail in which a carriage is adapted for movement to a plurality of locations. The guide rail is provided with slots, the sides of which form an abutment. The carriage comprises a pair of feet joined together by an elongated U-shaped bridge forming a track along which a locking block is adapted to move to a plurality of positions. The locking block is provided with shoulders which become seated in the slots of the guide rail when the locking block is in one position to prohibit movement of the carriage along the guide rail. In another position of the locking block on the track, the shoulders on the locking block are extracted from the slots in the guide rail to permit movement of the carriage to the desired position. When the locking is in the position having the shoulders seated in the slots in the guide rail, an S-shaped member is passed under the bridge of the carriage and engages the locking block to hold the locking block in its position in the guide rail slots thereby

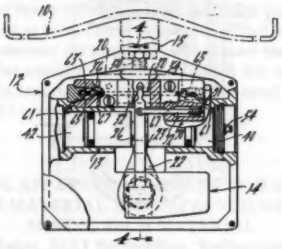
locking the carriage in the desired location along the guide rail. In a second embodiment of the invention, a pair of spaced shoulders are provided on the locking block and the length of the locking block is such that it will engage the bridge member before the second shoulder on the locking block is extracted from the slots in the guide rail so that the locking block is contained within the bridge of the carriage to form a gravity lock when the load holding device is used in an overhead position.

3,713,617

SELF LEVELING TRACTOR SEAT

Louis J. Bogdan, Davenport, Iowa, and Jere S. Culp, Elkhart, Ind., assignors to Kelsey-Hays Company, Romulus, Mich.

Filed Aug. 26, 1970, Ser. No. 67,125
Int. Cl. A47c 7/00
U.S. Cl. 248—371 **10 Claims**



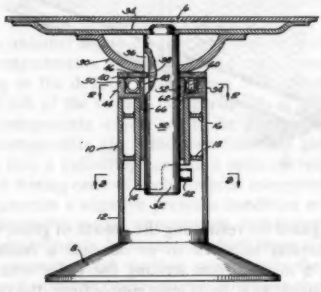
A self leveling seat assembly for tractors and the like comprised of a self-contained leveling unit which is simply connected to a tractor chassis by single bolt connection means, and wherein said self-contained leveling unit includes sealed therewithin a closed fluid filled loop with a single opposed piston in series within the loop. The seat is leveled by an operating force resulting from the weight upon the seat which is connected to the piston in a manner such that the weight causes the piston to displace the fluid in the loop in a direction which enables leveling of the seat.

3,713,618

SELF-CENTERING SUPPORT

Philip J. Hendrickson, and Richard J. Resch, both of Green Bay, Wis., assignors to Krueger Metal Products, Inc., Green Bay, Wis.

Filed March 22, 1971, Ser. No. 126,596
Int. Cl. F16c 11/00
U.S. Cl. 248—417 **3 Claims**



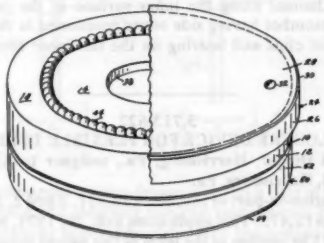
A support for a seat or the like can be rotated in either direction from its normally centered position. A helical spring extends circuitously around an annular channel concentric with the axes upon which the seat rotates. According to the direction of rotation, a depending arm disposed between seats for the ends of the spring engages one or the other end of the spring to displace the engaged end of the spring from its seat. When the deflecting force is released, the engaged end of the spring returns to its seat and, in so doing, acts on the depending arm to restore the arm to its normal position between the seated ends of the spring.

3,713,619

REVOLVABLE DEVICE FOR AIDING THE MOVEMENT OF A PARTIALLY DISABLED PERSON

Fred C. Marty, 2003 Hughitt Avenue, Superior, Wis.

Filed Oct. 28, 1970, Ser. No. 84,734
Int. Cl. F16m 13/00
U.S. Cl. 248—425 **3 Claims**



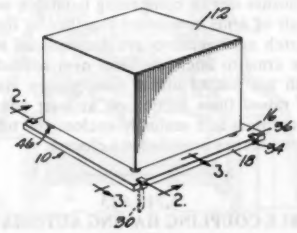
A revolvable device for aiding the movement of a partially disabled person including a main support, a revolvable member, means rotatably mounting the revolvable member on the main support, and means for varying the resistance to rotation of said revolvable member on said main support.

3,713,620

MACHINE SUPPORTING SLAB

George Tkach, 15314 Harrison Rd., P. O. Box 96, Mishawaka, Ind.

Filed Oct. 17, 1969, Ser. No. 867,262
Int. Cl. F16m 5/00
U.S. Cl. 248—19 **1 Claim**



A machine supporting slab formed of a rigid body of closed-cell foam resin material of high density covered by a metal sheath spanning the top and extending around the marginal edges of said body. Machine retaining means are anchored to said sheath.

3,713,621

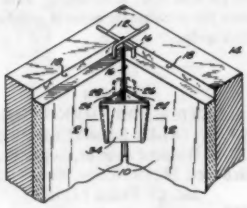
WEDGE ARRANGEMENT FOR A HOT TOP

Edwin J. Davidson, Wexford, Pa., assignor to Thiem Corporation, Milwaukee, Wis.

Filed Oct. 1, 1969, Ser. No. 862,872
Int. Cl. B22d 7/10
U.S. Cl. 249—106 **9 Claims**

A hot top structure for an ingot mold, the structure including a plurality of preformed insulating panels suspended

around the inside surface of the top of the ingot mold, a clip mounted on each edge of each panel, each clip having a flat inner section overlying a portion of the inner surface of the panel and an end section bent inwardly at an acute angle to



the flat inner section to form a downwardly and outwardly extending channel along the inner surface of the panel and a wedging member having side edges positioned in the channels of adjacent clips and bearing on the flat inner section of the clip.

3,713,622

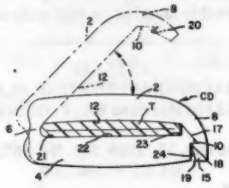
CLOSURE DEVICE FOR FLEXIBLE TUBING

Leon Joel Dinger, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 812,811, April 2, 1969, Pat. No. 3,612,475. This application Feb. 26, 1971, Ser. No. 119,271The portion of the term of this patent subsequent to Oct. 12, 1988, has been disclaimed.

Int. Cl. F16k *7/04*

U.S. Cl. 251—10 **5 Claims**



A tube closure device comprising bendable members each having a pair of arms connected together by integral hinges. Coacting latch arrangements are disposed on the extending ends of the arms to latch the arms over sections of flexible tubes which are placed under compression via the closure devices. A raised floor section on at least one of the arms serves to compress and sealingly enclose the tubes such that residual pressures are provided in a closure.

3,713,623

EXTENSIBLE COUPLING HAVING AUTOMATIC VALVE MEANS

Kenneth White Pearson, Somerset, England, assignor to Shipowners Refrigerated Cargo Research Association, London, England

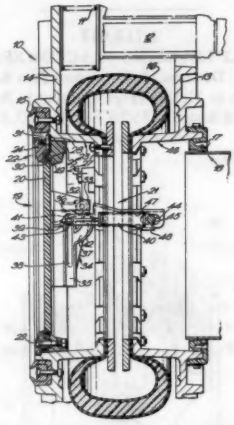
Filed March 22, 1971, Ser. No. 126,618

Claims priority, application Great Britain, April 19, 1971, 13,612/70

Int. Cl. F16l *29/00*

U.S. Cl. 251—150 **31 Claims**

A coupling designed particularly for connecting an aperture in a wall of a refrigerated transportable container with a supply of conditioning air is provided with a valve member wholly enclosed within the coupling and arranged automatically to open when the coupling is moved to an extended operative position and automatically to move to a closed position when the coupling is moved to a withdrawn inoperative position. The coupling includes an extenable hollow body or duct having connecting means at one end adapted to be connected around the first aperture leading to the supply of conditioning air and sealing means at the other end of the body adapted to be sealed in abutting relationship with a flat sealing surface surrounding the aperture in the container wall so as to provide a fluid passage from the first aperture to the second



aperture. Power means are associated with the coupling to move it between its extended operative position and its retracted inoperative position. It is desirable, but not essential, that the coupling, when in its extended operative position, can accommodate limited movement of the container wall aperture with respect to the first aperture leading to the conditioning air, in every plane.

3,713,624

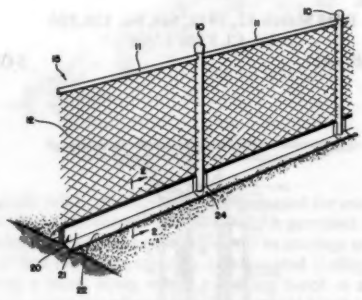
FENCE GUARD

Fred T. Niemann, 19 North Mount Prospect, Des Plaines, Ill.

Filed Sept. 17, 1971, Ser. No. 181,424

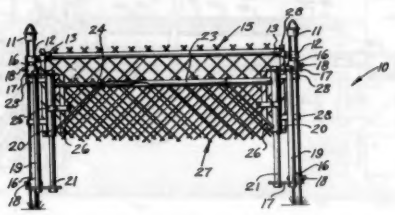
Int. Cl. E04h *17/06*

U.S. Cl. 256—32 **4 Claims**



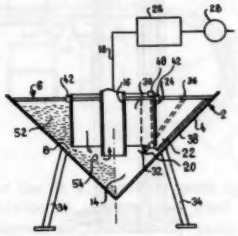
A fence guard for restricting the growth of grass, weeds and the like directly adjacent to or beneath a fence and for preventing a mower from striking the fence when mowing directly adjacent to it. In its most simple form, the fence guard is a length of material which is L-shaped in cross-section. A fence guard of this construction can be abutted against one or both sides of the fence. In a preferred embodiment, a pair of these fence guards are adapted to be affixed together to secure them against displacement.

3,713,625
CHAIN LINK FENCE LIFT
A. R. Trudell, 7173 Quincy Lane, Clearwater, Fla.
Filed Dec. 30, 1970, Ser. No. 102,806
Int. Cl. E04h 17/14
U.S. Cl. 256—32 3 Claims



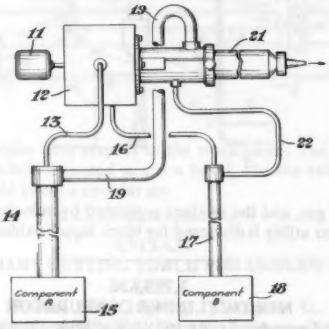
A section of fence which will have the lower portion of such construction so as to be raised or lowered in order to effectively use a lawnmower on the grass adjacent to the fence. This device includes upright members to which the upper portion of the fence is secured and also offsets the need for elevating or lowering the bottom portion of the fence.

3,713,626
MIXING APPARATUS FOR PULVERULENT OR GRANULAR MATERIAL AND IMPROVED METHOD FOR MIXING SUCH MATERIAL
Alwin Rolf Weber, 8611 Bertschikon, Switzerland, assignor to A. R. Weber AG, Zug, Switzerland
Filed Nov. 12, 1971, Ser. No. 198,253
Claims priority, application Switzerland, Nov. 17, 1970, 17001/70
Int. Cl. B01f 13/02
U.S. Cl. 259—4 15 Claims



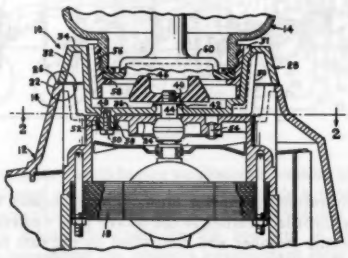
A method of, and apparatus for, admixing at least two fluent material components, especially pulverulent or granular materials, wherein the internal compartment of a material receiving container is sub-divided by partition walls into two storage compartments having a volume ratio essentially corresponding to the desired mixing ratio of the material components. Each of the storage compartments is filled with the material components which are to be admixed. The filled material components are withdrawn from the storage compartments into a collecting zone in a ratio corresponding to the desired mixing ratio of such material components. Means serve to generate a negative pressure condition at the region of the collected material components withdrawn from said storage compartments, by means of which there is produced a material conveying fluid medium stream over the surface of the collected material components to remove therefrom the components of the collected material in a ratio corresponding to the desired mixing ratio. The thus withdrawn material components to are then transported by the conveying fluid medium stream to a consumer while admixing such material components with one another during movement to such consumer.

3,713,627
MULTIPLE COMPONENT METERING AND MIXING DEVICE
Max Skobel, Edison, N.J., assignor to Dow Corning Corporation, Midland, Mich.
Filed Sept. 15, 1971, Ser. No. 180,595
Int. Cl. B01f 7/08
U.S. Cl. 259—6 16 Claims



A two component mixing device is fed by a pair of conveyor screws feeding and metering the two components from containers containing same. The outputs of the conveyor screws are fed into a mixing screw of varying depth which in turn feeds a nozzle suitable, for example, for feeding a mold. All screws can be powered by a single source.

3,713,628
KITCHEN BLENDER HAVING SELF-ALIGNING DRIVE MEANS
Arthur C. Christensen, Thomaston, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Jan. 28, 1971, Ser. No. 110,439
Int. Cl. B01f 7/16
U.S. Cl. 259—108 6 Claims

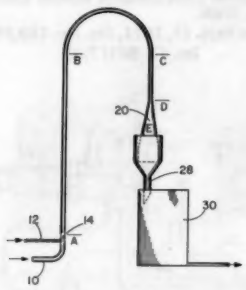


A kitchen blender having self-aligning shafts has its agitator cap firmly fitted into a laterally movable support ring mounted on the blender base. The ring is in the form of a cup and in the preferred embodiment includes antifriction means to facilitate lateral movement.

3,713,629
NON-FOAMING TWO-PHASE CONTACTOR
Robert F. Rieter, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Nov. 10, 1970, Ser. No. 88,313
Int. Cl. B01d 47/00
U.S. Cl. 261—112 8 Claims

Apparatus for obtaining intimate contact between gas and

liquid to promote mass transfer and subsequent phase separation without excessive foam. Liquid is entrained in high



velocity gas, and the mixture separated by velocity reduction. Particular utility is disclosed for black liquor oxidation.

3,713,630

MULTICYLINDER CARBURETOR

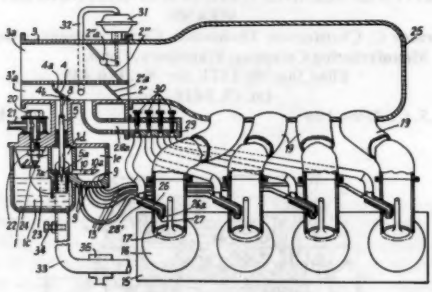
Bernard Laprade, Arudy (64) L'Esclaride; Xavier Laprade, Arudy (64) L'esgayade, and Pierre Gele, Odos-Tarbes (65) route de Lourdes, all of Odos-Tarbes, France

Filed Aug. 3, 1971, Ser. No. 168,620

Claims priority, application France, Sept. 11, 1970, 7033001

Int. Cl. F02m *9/08*

U.S. Cl. 261—23 A **2 Claims**



A carburation system for multicylinder engines having an auxiliary throttle member in the intake pipe upstream of the main throttle member and controlled by the rate of air flow through the intake pipe and serving to control the rate of fuel delivery.

3,713,631

HIGH TEMPERATURE FURNACE AND CONVEYOR THEREFOR

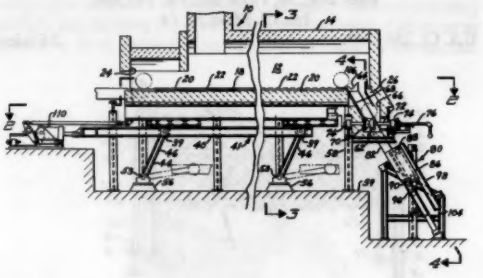
Albert T. Enk, Toledo, and David B. Franks, Maumee, both of Ohio, assignors to Midland-Ross Corporation, Toledo, Ohio

Filed March 8, 1971, Ser. No. 121,827

Int. Cl. F27b *9/14*; F27d *3/00*

U.S. Cl. 263—6 A **6 Claims**

A billet reheating furnace having a refractory surfaced walking beam conveyor with a lateral discharge means located within the furnace below the hearth line of the furnace at the discharge end of the walking beam conveyor. The walking beam conveyor is supported on pivotal stiff legs so it may be readily lowered beneath the hearth for servicing. A reciprocable transfer means is provided to lower a heated workpiece from the end of the walking beam conveyor to the lateral



discharge means without impact. The transfer means cooperates with the walking beam conveyor to rotate the workpiece a portion of a revolution.

3,713,632

HEAT REGENERATOR, PARTICULARY A HOT BLAST STOVE FOR A BLAST FURNACE PLANT

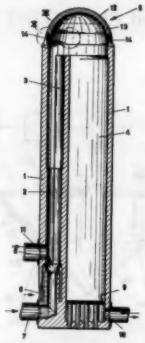
Albertus Hendrik Beenhakker, Santpoort, and Jacob Felthuis, Oudorp, both of Netherlands, assignors to Koninklyke Nederlandsche Hoogovens En Staalfabrieken N.V.

Filed March 2, 1971, Ser. No. 120,267

Claims priority, application Netherlands, March 3, 1970, 7003023

Int. Cl. F23l *15/02*

U.S. Cl. 263—19 R **6 Claims**



In a heat regenerator, in particular a hot blast stove for a blast furnace plant, which comprises an upstanding masonry structure closed on top by a dome of refractory bricks, the dome passes into the vertical masonry structure below it by means of a continuous series of elements which are pivotally connected both to the stove structures below it close to the upper edge of the vertical masonry structure and to the lower edge of the dome.

3,713,633

ROTARY DRYER

Joseph H. Falk, 4935 Wells Dr., Mission, Kans., and Lauren W. Burnett, 3700 Pennsylvania, Dubuque, Iowa

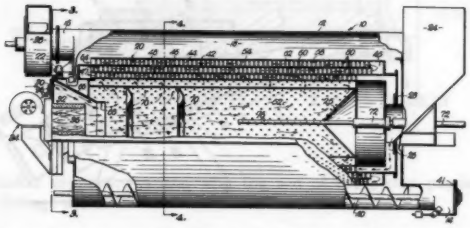
Filed Oct. 7, 1971, Ser. No. 187,419

Int. Cl. F27b *7/00*

U.S. Cl. 263—33 R **22 Claims**

A rotary dryer having a rotating drum presenting a central chamber and outer chamber separated by a perforated wall, wherein granular material is transported through the outer

chamber, and a material-drying airflow conducted into the central chamber flows radially through the outer chamber and material therein. Vanes disposed in separate, annular flights in the outer chamber effect complete circular tumbling and horizontal transporting of the material in multiple passes back



and forth along the entire length of the drum at substantially right angles to the radial airflow. The form of the invention illustrated is capable of flash-drying and heating grain crops as a continuous process immediately after and as a part of the harvesting of the grain.

3,713,634

DEVICE FOR SEALING TRAVELLING GRATES

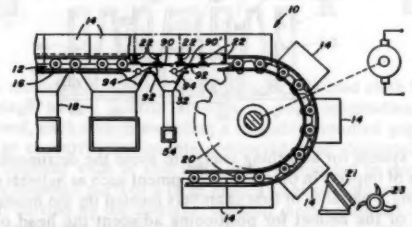
Klaus Moller; Dietrich Munch, and Hartmut Wolert, all of Frankfurt/Main, Germany, assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Aug. 24, 1970, Ser. No. 66,185

Claims priority, application Germany, Aug. 23, 1969, P 19 43 024.1

Int. Cl. F27b *21/02*

U.S. Cl. 266—21 **8 Claims**



A device for use in a travelling grate type metallurgical processing machine to seal an end wind box against the passage of external air thereinto or gases therefrom. The device includes a sealing plate arranged adjacent an end wind box and in abuttment with the under support surfaces of the pallets as they pass over the plate. A lever supports the plate in its abutting relationship with the pallets. The lever is pivotally supported at an intermediate point to the machine structure and has one end pivotally fixed to the underside of the sealing plate. The plate is, thus, able to move away from the pallet but not laterally thereof. A counterweight is arranged on the free end portion of the lever to provide a uniform pressure on the plate, while permitting flexing thereof. An optional sealing box is provided opposite the sealing plate for drawing in any gases flowing between the sealing plate and the pallets.

3,713,635

OXY-ACETYLENE CUTTING TORCH-HOLDER AND GUIDE

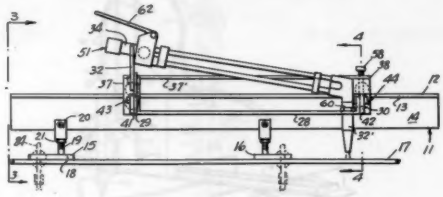
Emil Strnad, 280 Lafayette Pkwy., Lexington, Ky.

Filed Feb. 26, 1971, Ser. No. 119,168

Int. Cl. B23k *7/06*

U.S. Cl. 266—23 HH **8 Claims**

A torch guide consisting of a rail which can be clamped onto a work piece adjacent an intended path of cut, a carriage movably supported on the rail, and a bracket on the carriage to receive a cutting torch and support the torch nozzle in



cutting position with respect to the work piece. The bracket can be angularly adjusted to cut a bevel, and the rail can be pivotally held to cut a circular arc.

3,713,636

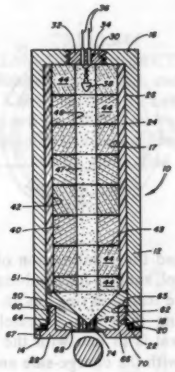
INCENDIARY CUTTING TORCH FOR UNDERWATER USE

Horace H. Helms, Silver Spring; Alexander G. Rozner, Bethesda, both of Md., and Dana E. Spencer, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 22, 1970, Ser. No. 74,434

Int. Cl. B23k *7/00*; C06d *1/10*

U.S. Cl. 266—23 NN **5 Claims**



An incendiary torch having a cylindrical housing with a nozzle positioned at one end thereof. The nozzle is held in place by a retainer cap threadedly attached to the housing which includes a diaphragm overlying the aperture in the nozzle thereby preventing the ambient environment from entering the torch chamber. The end of the torch housing may be connected to a work holding device.

3,713,637

PORTABLE FLAME CUTTING MACHINE

H. Edward Cable, Thornburg; Herbert E. Cable, Mount Lebanon Township; and John A. Cable, Moon Township, all of Allegheny County, Pa., assignors to Weld Tool Corporation

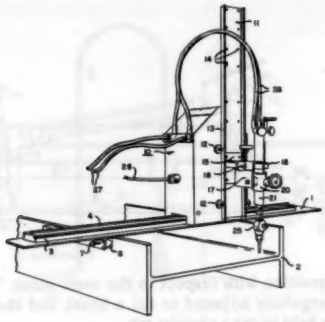
Filed Jan. 5, 1971, Ser. No. 103,985

Int. Cl. B23k *7/00*

U.S. Cl. 266—23 M **6 Claims**

A portable flame cutting machine which includes an elongated guideway or base rail with rack upon which a carriage is driven and supported. The carriage carrying an auxiliary rail with rack movable perpendicularly to the base rail and carry-

ing a laterally adjustable or movable torch holder for mounting a torch having a universally pivotable torch tip. The car-



riage contains a pair of drive units operably connected to the guideway rack and the auxiliary rail rack, and optionally a third lateral drive unit.

3,713,638

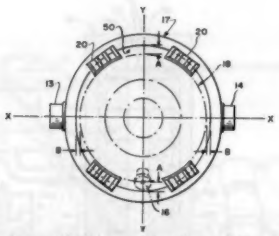
CONVERTER VESSEL WITH OVAL TRUNNION RING

Edmund Clarence Langmead, Glen Ellyn, and Gerald DeWane, Chicago, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Dec. 2, 1970, Ser. No. 94,281

Int. Cl. C21c 5/50

U.S. Cl. 266—36 P **2 Claims**



A trunnion ring and the combination of the trunnion ring and a converter vessel, such as for steel-making, supported or mounted therein. The trunnion ring has an oval, i.e. oblong or elliptical-like, opening in which a vessel is mounted. The minor axis of the oval is in line with the trunnions and the major axis is in line with the charge-side and tap side of a vessel. With the oval trunnion ring, rather than a circular trunnion ring, greater clearance between the vessel wall and the trunnion ring is provided initially or preservice in the direction in which the vessel will enlarge from thermal stresses. When such growth occurs there will still be adequate air space between the vessel wall and trunnion ring for air cooling to avoid over-heating the trunnion ring.

3,713,639

MELTING OR HOLDING VESSEL FOR LIQUID METALS WITH AN ADJOINING ELECTROMAGNETIC CONVEYING TROUGH

Axel von Starck, Remscheid-Luttringhausen, and Friedrich Schnake, Rheinhausen, both of Germany, assignors to AEG Elotherm GmbH, Remscheid-Hasten, Germany

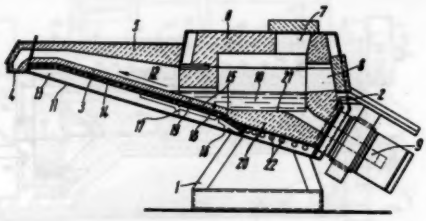
Filed Aug. 10, 1971, Ser. No. 170,476

Claims priority, application Germany, Aug. 21, 1970, P 20 41 559.2

Int. Cl. C21c 7/00

U.S. Cl. 266—38 **5 Claims**

A melting and holding vessel for liquid metals with an adjoining electromagnetic trough in which the active inductor surface at its bottom end adjacent the vessel and in the region of the first pole is much more steeply pitched in relation to the horizontal than in the region of the upwardly following poles and the thickness of the refractory lining between the active



inductor surface and the trough bottom increases towards the end of the inductor and gradually merges into the refractory lining of the vessel, so that the risk of cracking in the transitional zone between vessel and trough is substantially avoided.

3,713,640

ENERGY ABSORBING AND SIZING MEANS FOR HELMETS

Gerard E. Margan, Lake Forest, Ill., assignor to Riddell, Inc., Des Plaines, Ill.

Division of Ser. No. 808,800, March 20, 1969, which is a continuation-in-part of Ser. Nos. 457,016, May 19, 1965, abandoned, and Ser. No. 664,748, Aug. 31, 1967, abandoned. This application July 27, 1970, Ser. No. 58,462

Int. Cl. F16f 9/10

U.S. Cl. 267—117 **9 Claims**

A system for absorbing energy to avoid the detrimental effects of impacts in protective equipment such as helmets comprising a plurality of first chambers located on the inside surface of the helmet for positioning adjacent the head of the wearer. A substantially non-compressible fluid is included within these first chambers, and conduits connect the first chambers with corresponding second chambers. Upon impact, fluid is displaced to the second chambers, and, due to the design of the chambers, the displaced fluid is returned to the first chambers when the force of the impact is removed.

Sizing means useful with the energy absorbing means or in other applications are located on the interior of the helmet surface. The sizing means include expandable compartments, and valves are associated with these compartments whereby a user of the helmet can place the helmet on his head after which air is introduced into the compartments until a proper fit is achieved. Energy absorbing pads are preferably located within the compartments to serve as additional safeguards under high impact conditions.

3,713,641

DAMPING APPARATUS

Giles A. Kendall, Burbank, Calif., assignor to Menasco Manufacturing Company, Burbank, Calif.

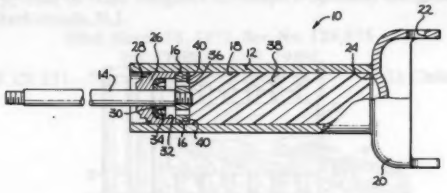
Filed Feb. 8, 1971, Ser. No. 113,516

Int. Cl. F16f 3/10

U.S. Cl. 267—139 **7 Claims**

A damping apparatus composed of a relatively few number of parts wherein an orifice piston is movably mounted within a

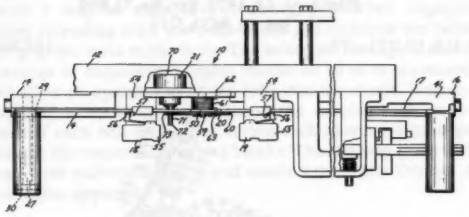
compressible solid chamber formed within a housing, the housing being crimped about an exteriorly serrated collar, the collar supporting a seal with the rod of the piston passing through the collar.



3,713,642
MANUALLY CONTROLLED CLOTH LAYING MACHINE CARRIAGE

Stephen Paterson, Forest Hills Gardens, N.Y., assignor to Cutting Room Appliances, New York, N.Y.

Filed Dec. 2, 1970, Ser. No. 94,494
Int. Cl. B65h *29/46*
U.S. Cl. 270—31 **3 Claims**



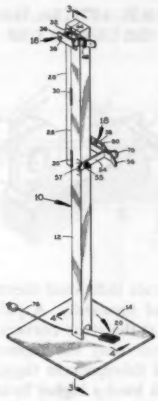
A manually controlled electric motor powered cloth laying carriage having control stations at each longitudinal end thereof, each station including a rotatably mounted grip having an eccentric portion interconnected to an elongated link, the opposite ends of said links being connected to eccentrically disposed parts of a large gear. The gear is mounted on a shaft carried by the carriage, resilient means associated with the gear returning the links to predetermined position in the absence of manually imparted torque applied to either grip. A rotary potentiometer is mechanically connected to said gear by a pinion on the shaft of the potentiometer to determine the amount of current flowing to the drive motor as a function of rotation of either grip. Each link carries switch actuating means individually cooperating with one of a pair of switches which close, depending upon which grip is rotated. The switches may be connected in parallel to be used in conjunction with separate direction-indicating switches, or in such manner as to reverse the polarity of current flowing through the motor, in addition to supplying current to the potentiometer.

3,713,643
FOLDING AID

Roland W. Gerstenberger, Fort Lauderdale, Fla., assignor to Jensen Machinery Inc., Fort Lauderdale, Fla.

Filed Jan. 4, 1971, Ser. No. 103,618
Int. Cl. B65h *45/00*
U.S. Cl. 270—61 R **8 Claims**

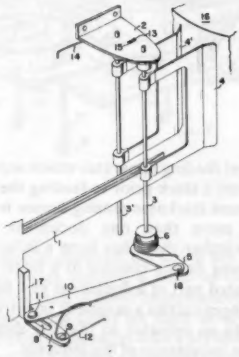
A clamping device is movably mounted on an upright post at an elevated position for releasably holding a laundry article with a portion of the article extending generally downwardly so that the rest of the article may be stretched out horizontally from the clamping device. When the article is pulled, an actuator releases the article from the clamping device, and the article folds longitudinally at a retainer spaced below the clamping device. The article may then be folded transversely toward the retainer.



3,713,644
SHEET FILM CURL CORRECTING DEVICE

Takeshi Okano, Nishinomiya, Japan, assignor to Fuji Shashin Film Kabushiki Kaisha, Kanagawa-ken, Japan

Filed April 29, 1971, Ser. No. 138,533
Claims priority, application Japan, May 18, 1970, 45/48075
Int. Cl. B65h *3/66*
U.S. Cl. 271—8 **6 Claims**

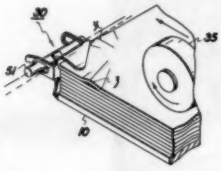


A sheet film curl correcting device so operative that it is closed towards the leading edge of a sheet film in association with the operation of a film inserting mechanism, immediately before said sheet film is inserted into a predetermined position of a film magazine, thereby to guide said film from both sides with a slight space therebetween, and is opened immediately after the leading edge of the film has been inserted into the magazine.

3,713,645
SHEET SEPARATING APPARATUS

Patrick T. Ferrari, Fairport, and Clinton E. Farnsworth, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed April 26, 1971, Ser. No. 137,389
Int. Cl. B65h *3/56*
U.S. Cl. 271—18 R **4 Claims**

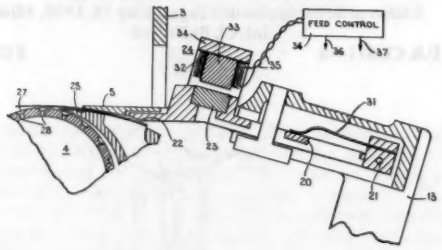


Apparatus to separate individual sheets from the top of the stack as they are fed forwardly. A pair of sheet separator members positioned at the stack corners resist the movement of the sheets to force only the topmost sheets to buckle thereover and be fed therepast. In the case of relatively stiff sheets or those which have a higher beam strength, the sheet separator members are caused to deflect outwardly thereby enabling the stiffer sheets to buckle slightly to overcome the resistence of the movable sheet separator members enabling separation of the topmost sheet from the stack without tearing or otherwise damaging it.

3,713,646
DOCUMENT HANDLING APPARATUS

Roman Derc, Letchworth, England, assignor to International Computers Limited, London, England

Filed Sept. 3, 1970, Ser. No. 69,206
Claims priority, application Great Britain, Sept. 5, 1969, 44,027/69
Int. Cl. B65h *7/12*
U.S. Cl. 271—57 **4 Claims**



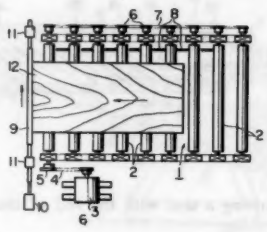
In a document feeding apparatus which separates an edge of a document from a stack prior to feeding the separated document, a document thickness sensing device is employed to detect whether more than one document edge has been separated or whether there has been a failure to separate an edge. The sensing device consists of a finger which is moved over the separated part of a document as it lies on a reference surface. The finger carries a magnetic insert which is magnetically coupled to an inductor so that the displacement of the finger alters the inductance of the inductor.

3,713,647
METHOD AND DEVICE FOR POSITIONING SHEET MATERIAL

Masanori Tamura, Oobu; Muneyuki Fukuda, Nagoya, and Yoji Ogawa, Nagoya, all of Japan, assignors to Kabushiki Kaisha Taihei Seisakusho, Nagoya-shi, Japan

Filed Oct. 5, 1971, Ser. No. 186,713
Int. Cl. B65h *9/06*
U.S. Cl. 271—58 **7 Claims**

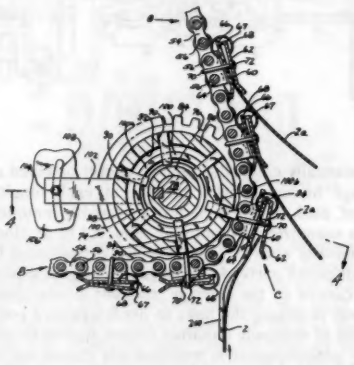
In a method and device for positioning a sheet material, the sheet material is conveyed on a plurality of conveyor rollers of minimized surface friction, caused to abut a stop member extending transversely at the forward end of the conveying path of the sheet material, and then the stop member is shifted along the transverse direction so that the sheet material abutting the stop member is displaced transversely toward another stop member extending along the conveying direction of the sheet material while the sheet material is supported on the conveyer rollers of minimized friction.



3,713,648
CONVEYOR FOR CARDS AND THE LIKE

Wolfram Spika, Sparta, N.J., assignor to Bobst Champlain, Inc., Roseland, N.J.

Filed Sept. 14, 1970, Ser. No. 71,890
Int. Cl. B65h *5/14*
U.S. Cl. 271—79 **14 Claims**



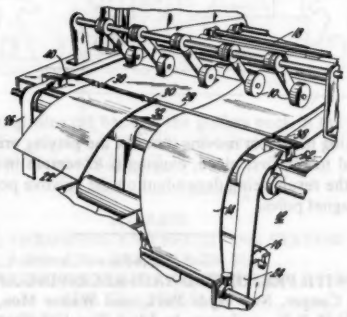
A conveyor comprises an elongated element on which are arranged a plurality of openable and closable grippers. As the conveyor moves along its path it is acted upon by control means acting on the grippers to cause them to open and close at appropriate times. These control means are located at appropriate operating stations for the conveyor system as a whole, for example, at stations where the objects to be conveyed are inserted into the conveyor, where they are released from the conveyor, where undesired objects may be rejected, and where the alignment of objects carried by the conveyor may be corrected or optimized. As specifically disclosed, the control means is incorporated into a rotatable element over which the elongated element passes. That rotatable element is provided with a plurality of radially outwardly projectable parts which, when they come opposite the grippers on the conveyor means, are effective to cause the grippers to open or close depending upon whether those parts are outwardly or inwardly positioned. The positioning of the parts is determined by a cam, preferably adjustable positionable, with respect to which the parts are moved by the rotatable element as the conveyor system operates.

3,713,649

CONVEYOR SYSTEM

Charles Van Kempen, Westwood, and Paul Zamek, Little Ferry, both of N.J., assignors to Simplex Specialty Co., Inc., Hackensack, N.J.

Filed March 18, 1971, Ser. No. 125,575
Int. Cl. B65h *5/08, 29/04*
U.S. Cl. 271—79 21 Claims



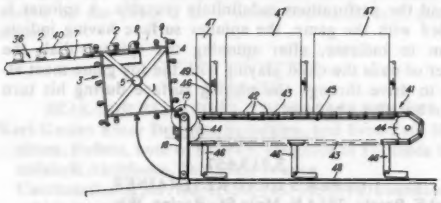
In the conveyor system disclosed a rod grasps the forward ends of sheets to be conveyed by means of clips articulated on the rod. The rod extends between two parallel endless belts to which it may be engaged and disengaged. When engaged clasps extending from the ends of the rod embrace the belts and grip the webs of the belts. The belts pass through tapered openings in respective warping blocks so as to be squeezed and allow an operator to fit the belts into the clasps. Respective 180° twists in the belts reverse the warping each increment of each belt undergoes during each successive passage through the respective warping blocks. The rod may grasp and draw both individual sheets and continuous sheets through a processing apparatus.

3,713,650

STACKING OF SHEETS

Joseph B. Hodgkinson, Billinge, and Roger John Morey, Pennington, both of England, assignors to Pilkington Brothers Limited, Liverpool, England

Filed Feb. 19, 1971, Ser. No. 116,765
Int. Cl. B65h *31/04*; B65g *47/00*
U.S. Cl. 271—87 11 Claims



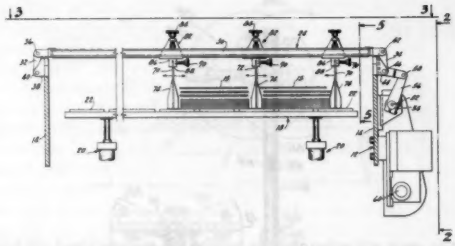
Apparatus for stacking a succession of sheets generally vertically on a support surface, comprises a sheet carrying face which is presented generally horizontally beneath a sheet to be stacked, and then moved to a substantially vertical position with the shee. Means are provided to engage the lower edge of the sheet and to carry the lower edge into a desired position on the support surface. The succession of sheets thereby form a stack of sheets, e.g. on a pallet.

3,713,651

JOGGER ASSEMBLY FOR CARTON BLANK STACKER

Norman C. Abler, Menomonee Falls, and Peter Zernov, Wauwatosa, both of Wis., assignors to Zerand Corporation, New Berlin, Wis.

Filed Feb. 1, 1971, Ser. No. 111,564
Int. Cl. B65h *31/34*
U.S. Cl. 271—89 6 Claims



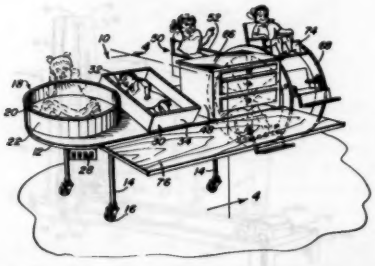
A carton blank jogger assembly for a carton blank stacker including a number of jogger plates alternately secured to parallel cross bars which are oscillated in equal but opposite directions to jog each alternate stack of carton blanks on each reversal of motion of said cross bars. A tooling block is secured to the lower edge of each jogger plate in a position to guide and jog the carton blanks into stacks. Each tooling block has an upper beveled guide surface and an inner jogging surface which conforms to the configuration of the blank being stacked.

3,713,652

MOVABLE CHAIR ENTERTAINMENT UNIT

Roy R. Rakestraw, R. F. D. No. 1, Lamar, Mo.

Filed Sept. 24, 1970, Ser. No. 75,177
Int. Cl. A63g *31/00*
U.S. Cl. 272—1 R 8 Claims



An elevated mobile platform on which are mounted a plurality of devices which support a child or doll, wherein the devices are manipulated to move independently of each other and with motions which differ for each device. The unit also includes a small chest of drawers with a pivotally mounted top, the support panel itself having a pivotally mounted extension.

3,713,653

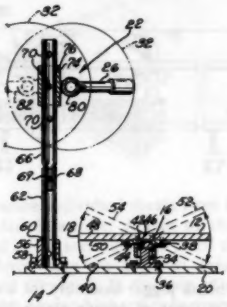
EXERCISING DEVICE WITH ROTATABLE HANDBAR AND PIVOTAL TURNTABLE

John F. Romans, 7521 Valley Villas Drive, Cleveland, Ohio

Filed Oct. 30, 1970, Ser. No. 85,686
Int. Cl. A63b *23/00*
U.S. Cl. 272—57 R 3 Claims

An exercising device for use by an exerciser includes a turntable for supporting the exerciser and a frame for support-

ing the turntable about a pivot point. The turntable has an outer peripheral edge which is positionable to contact a fixed member lying in a plane disposed from the pivot point. The pivotal support of the frame allows the peripheral edge of the turntable to have a rolling contact with the fixed member. The exercising device also includes a handbar including a pair of handbar members, each of which may be gripped by the hands of the exerciser. The handbar device also includes means for



connecting the handbar members and means for adjusting the positions of the handbar members with respect to each other. The frame rotatably receives the handbar members and constrains movement of the handbar members to a fixed circular path. The handbar device is rotatable about an axis so that the handbar members move in a fixed circular path when rotated by the hands of the exerciser. The frame is collapsible so that the exercising device may be stored or shipped in a compact configuration.

3,713,654

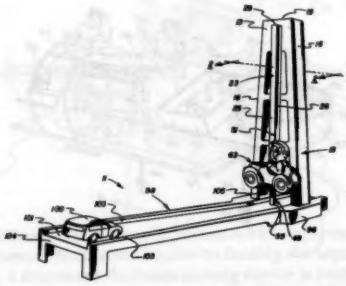
MOVING TARGET GAME

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif.

Filed Feb. 24, 1971, Ser. No. 118,215

Int. Cl. A63b *71/00*

U.S. Cl. 273—108 **9 Claims**



A game comprising a swinging pendulum having mounted thereon a segmented assembly whose segments are held together in cooperation with the pendulum. At least one segment of the assembly is spring loaded on the pendulum such that when a movable target section of the pendulum is truck by a toy car or other object properly aimed thereat the segmented assembly will fly apart.

3,713,655

MAGNETIC PLAY APPARATUS

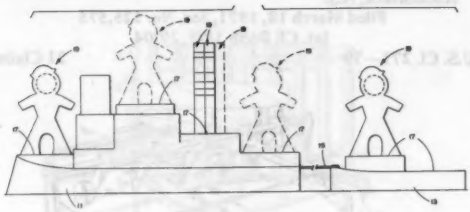
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif., and Rene' Soriano, Los Angeles, Calif., assignors to said Goldfarb, by said Soriano

Filed Jan. 15, 1971, Ser. No. 106,775

Int. Cl. A63f *3/00*

U.S. Cl. 273—135 AD **10 Claims**

Magnetic play apparatus comprising a plurality of individual defined separate playing areas and a plurality of playing pieces, each piece having a magnet therein, such that when a playing piece is placed upon a defined playing area, an additional piece placed thereon will either repel the first piece,



knocking it over or moving it out of the playing area, or be attracted to the first piece, causing it to remain in the playing area, the result being dependent on the relative positioning of the magnet poles.

3,713,656

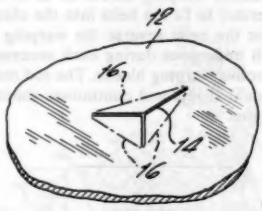
BOX WITH PREFORMED NAIL-RECEIVING APERTURES

Julius Cooper, New Hyde Park, and Walter Moe, Plainview, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Division of Ser. No. 878,134, Nov. 19, 1969, Pat. No. 3,608,903. This application Aug. 18, 1971, Ser. No. 172,764

Int. Cl. A63f *9/00*

U.S. Cl. 273—135 R **3 Claims**



A toy game apparatus and playing pieces including an opaque box with an open bottom and with the top thereof providing a playing surface having pre-cut nail-receiving perforations. The game progresses with ballons being placed within the confines of the opaque box and each child in turn, attempting to drive one or more nails through the playing surface without bursting a balloon. The pre-cut perforations are shaped and formed in a construction making the playing surface and the perforations indefinitely reusable. A spinner is provided with the game, the spinner surface having indicia thereon to indicate, after spinning the spinner dial, the number of nails the child playing with the toy game must attempt to drive through the playing surface during his turn without bursting a balloon.

3,713,657

GOLFER'S HEAD RESTRAINER

Gabriel E. Presta, 2714 N. Main St., Racine, Wis.

Filed May 22, 1972, Ser. No. 255,595

Int. Cl. A63b *69/36*

U.S. Cl. 273—190 R **12 Claims**

A golfer's head restrainer which includes a collar portion for engirdling a golfer's neck, and an upstanding portion extending from the collar portion and up to the back of the golfer's head to restrain the golfer's head in a forward tilted position. The collar portion has straps and a fastener which permits releasable fastening around the golfer's neck, and the upstanding portion at the back of the golfer's head is a metal plate, and a leather or like covering encloses the plate and

forms the collar straps. Integrally formed with the lower end of the rigid upstanding metal plate is a rigid metal arcuate portion which engirdles the back of the golfers neck in the plane of the collar portion, whereby the restrainer is rigid throughout its rearward half.

3,713,658

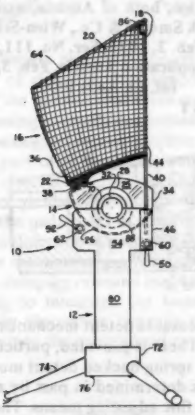
BALL THROWING AND RECEIVING SYSTEM

Jay E. Cook, Ashland Road, Cockeysville, Md.

Filed Nov. 20, 1970, Ser. No. 91,455

Int. Cl. A63b *69/40*

U.S. Cl. 273—26 D **7 Claims**



A ball-throwing and receiving system consisting typically of a yoke-shaped, tripod supported base, a motor driven flexible-disc ball-propelling unit adjustably clamped in the yoke, and a rectangular-throat conical net above the ball propelling unit connected at the small end to the ball-propelling unit and at the large end to a rectangular-throat frame pivotally supported by the yoke; a table tennis embodiment is also disclosed.

3,713,659

SEAL FOR RELATIVELY ROTATABLE PARTS

Karl Gustav Einar Derman, Savedalen, and Sven-Erik Malmstrom, Reftele, both of Sweden, assignors to Forsheda Gummifabrik Aktiebolas, Forsheda, Sweden

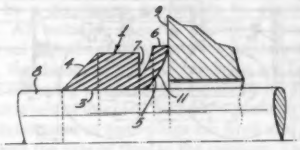
Continuation of Ser. No. 1,954, Jan. 12, 1970, abandoned, which is a continuation of Ser. No. 703,334, Feb. 6, 1968, abandoned, which is a continuation of Ser. No. 543,155, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 72,741, Nov. 30, 1960, abandoned. This application Aug. 21, 1970, Ser. No. 66,028

Claims priority, application Sweden, Dec. 7, 1959, 11482/59

Int. Cl. F16j *15/32*

U.S. Cl. 277—95 **7 Claims**

A seal for two relatively rotatable parts of the type wherein a rotary shaft projects through a bearing housing wall that is disposed transversely to the shaft comprising an annular sealing member consisting of a resilient ring having a tubular body portion and an integral annular thin flexible lip projecting from one end thereof. The annular lip is defined at its inner end adjacent the body portion by an annular separation and has an outer wall constituted by an inwardly directed surface of revolution having a base angle of between 30° and 60° facing and normally bearing against the housing wall around the opening to seal the same. The ring body when unstretched has a smaller inner diameter than the outer diameter of the shaft and the body portion has a mass at least twice the mass of the lip to provide in combination with the smaller inner diameter the sole means for fixedly securing the ring against axial and rotational displacement on the shaft in position to cause the flexible lip to bear against the housing wall and seal the opening. The outer axial end face of the lip is provided with a spiral groove which produces a pumping effect upon rotation urging the lubricant radially outwardly toward the area of engagement of the lip and the wall of the bearing housing.



3,713,660

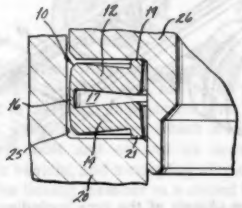
METAL SEAL FOR A CONTROL VALVE OR THE LIKE

Fred J. Luthe, Marshalltown, Iowa, assignor to Fisher Controls Company, Inc., Marshalltown, Iowa

Filed Nov. 10, 1970, Ser. No. 88,433

Int. Cl. F16j *15/08*

U.S. Cl. 277—206 R **5 Claims**



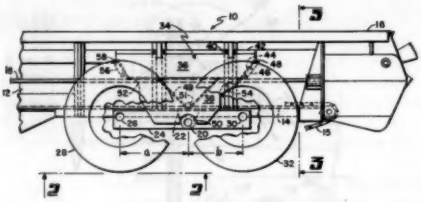
A metallic seal for maintaining a seal between mating parts of a control valve, or the like, notwithstanding substantial thermal expansion, contraction or shock conditions. The seal is characterized by an annular body of stiff, resilient metal formed to have a generally U- or V-shaped cross section. The upper and lower disk-like portions of the seal are joined by an integrally-formed hinge provided along the inside or outside diameter of the annular body, depending upon whether the seal is designed to receive high pressure internally or externally. The hinge portion of the annular body is thin in comparison to the upper and lower disk-like portions so that the deflection of the hinge portion occurs substantially within the plastic region (i.e. as a result of stresses above the yield strength thereof), while the deflection of the disk-like portions occurs within the elastic region (i.e. stresses below the yield strength thereof). In this manner the metal seal exhibits the combination of substantial load-carrying and elastic deflection characteristics similar to that of a spring element.

3,713,661

MUD GUARD FOR TANDEM AXLE ASSEMBLY

Paul A. Luthman, Maria Stein, and Thomas R. Fischer, Wapakoneta, both of Ohio, assignors to Avco Corporation, Coldwater, Ohio

Filed May 28, 1971, Ser. No. 147,760
Int. Cl. B60g 5/02
U.S. Cl. 280—104.5 R 7 Claims



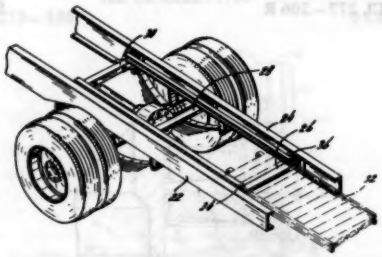
The disclosure illustrates a mud guard skirt for a tandem axle assembly of a manure spreader. The skirt is positioned in such a manner that it removes foreign material from both the forward and aft wheels and in addition protects the axle assembly when manure is being loaded into the spreader from its side.

3,713,662

CHASSIS WITH STORAGE SPACE

John C. Abromavage, Tempe, and Henry S. Shattles, Phoenix, both of Ariz., assignors to Advanced Management Engineering & Research Co.

Division of Ser. No. 837,246, June 27, 1969, Pat. No. 3,559,826. This application Oct. 14, 1970, Ser. No. 80,586
Int. Cl. B62d 21/00
U.S. Cl. 280—106 R 1 Claim



An automotive chassis of the type including a pair of longitudinally extending channels and a plurality of transverse cross members intersecting said channels, the transverse members being of a reduced cross section so as to define a longitudinally extending storage space intermediate the tops of the transverse cross members and the tops of the pair of channels, particularly such a construction used to support a longitudinally extending ramp slidable from the rear end of the chassis to facilitate loading of the truck.

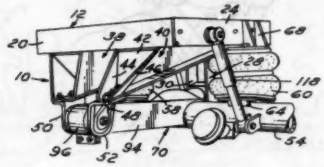
3,713,663

VEHICLE SUSPENSION

Ole Granning, Detroit, Mich., assignor to Granning Suspensions Inc., Dearborn, Mich.

Filed Jan. 28, 1971, Ser. No. 110,420
Int. Cl. B60j 11/26
U.S. Cl. 280—112 R 6 Claims

The vehicle suspension provides an axle assembly which may be mounted either on a truck-tractor or a truck trailer. The suspension includes an axle which is suspended from the vehicle frame by means of a pair of springs. An integral drawbar and guide member is secured to the axle. The integral member includes a drawbar portion which extends forwardly for resilient securement to vehicle structure. A guide portion extends in the opposite direction for sliding engagement with vertical guide means. The integral member includes a central



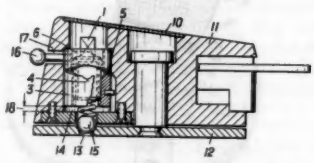
portion having transverse recess means on the underside which is received on the axle to orient the integral member with respect to the axle and provide means for welding the integral member to the axle. The welding is on diametrically opposite sides of the recess but not on the top thereof to leave the top portion of the axle free from restraint to permit stress relief.

3,713,664

SPRING LOCKING DEVICE

Thomas Gordon Smolka, 1238 Wien-Mauer, and Johann Zelinka, 1100 Wien, both of Austria, assignors to Wiener Metallwarenfabrik Smolka & Co., Wien-Schwechat, Austria

Filed Feb. 2, 1971, Ser. No. 111,874
Claims priority, application Austria, Feb. 3, 1970, 959
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 8 Claims



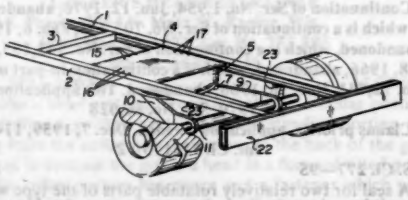
Spring backed releasable detent mechanism particularly for safety ski bindings. There is provided, particularly for use in a safety ski binding, a spring backed detent mechanism wherein the spring tension is determined in part by a rough adjusting means and partly by fine adjusting means. The rough adjusting means is contained within the mechanism where it is accessible only to the possessor of a predetermined special tool, such as would be available in a ski shop, and not to a skier on the slope and only the fine adjustment is accessible to the skier under conditions of normal use.

3,713,665

AIR SUSPENSION WITH TAPERED AIR BAG

Rene Gouirand, New York, N.Y., assignor to Joseph Mercadante, Greenwich, Conn.

Filed Jan. 28, 1971, Ser. No. 110,704
Int. Cl. B60g 11/26
U.S. Cl. 280—124 F 21 Claims



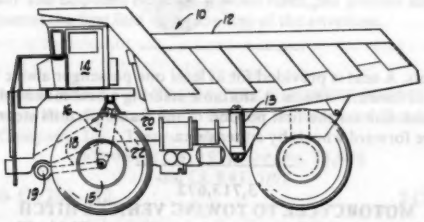
An air bag having a tapered cross-section in the direction of the length of the vehicle has one surface mounted to the vehi-

cle frame. The other surface of the air bag contacts a suspension member which extends outward (as a lever member) from the greater cross-sectional portion of the air bag and the vehicle axle is attached thereto. In one embodiment the suspension member is flexibly coupled to the chassis by flexible cables, or the like, including side cables which prevent side-sway of the vehicle.

3,713,666
RIDE CYLINDER

Ronald M. Cheers, Mentor, and Johannes Fisch, Euclid, both of Ohio, assignors to Euclid, Inc., Cleveland, Ohio

Filed Sept. 14, 1970, Ser. No. 71,836
Int. Cl. B60g *11/26*
U.S. Cl. 280—124 R **8 Claims**

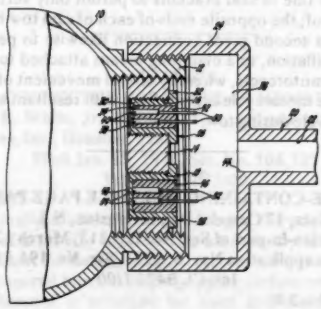


A vehicle suspension especially for off-the-highway trucks including a pair of ride cylinders supporting a part of the sprung weight of the vehicle. Each ride cylinder comprises an outer tubular housing pivotally connected to the frame and an inner tubular housing, telescoping within the outer, pivotally connected to a part of the vehicle running gear such as an axle. A series of elastomeric pads stacked upon each other inside the cylinders yieldably absorb oscillations of the frame and axle. All of the pads coact in absorbing compressive load deflections in one direction telescoping the housings into each other. A cylinder mechanism operates with a smaller group of the same pads in damping rebound loads acting in the opposite direction tending to telescope the housings apart. The bi-directional energy absorption capacity provides a smoother ride without reducing the overall load carrying capacity of the cylinder.

3,713,667
OCCUPANT RESTRAINT SYSTEM

Houston F. Blanchard, Greenfield, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1971, Ser. No. 175,577
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **1 Claim**

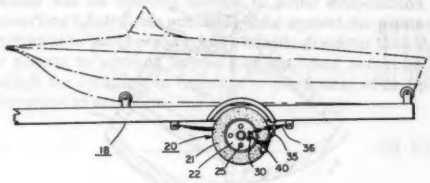


A vehicle body occupant restraint system includes a source of pressure fluid, an inflatable occupant restraint cushion, and a passage communicating with the cushion and having an orifice of predetermined flow area. An end wall of the pressure vessel includes a pair of plugs, each comprising an externally threaded hollow body threaded into a threaded opening of the end wall. The bores of the plugs are located parallel of each other and communicate in series with the passage orifice through an antechamber of a member containing the passage and opening to the bores of the plugs. The bore of one plug is of lesser predetermined flow area than the passage orifice, and the bore of the other is of greater predetermined flow area than the passage orifice. Each plug bore is closed to the pressure vessel by a diaphragm rupturable by electrically fired detonators. At vehicle impacts above a predetermined minimum level of intensity and below a predetermined maximum level, the detonators of the one plug are fired and the bore of the one plug controls the flow rate to the cushion. Upon impact levels of intensity above the predetermined maximum, the detonators of both plugs are fired and the passage orifice controls the rate of flow to the cushion. The latter rate of flow is the normal rate of flow so that the cushion inflates during the normal time period. The former rate of flow is reduced so that the time period of inflation is increased.

3,713,668
PROTECTIVE DEVICE FOR TRAILERS AND LIKE VEHICLES

Walter E. Flindt, Warminster, Pa., assignor to Walter E. Flindt, Warminster, Bucks County and William V. Hostelley, Jr., Abington, Montgomery County, Pa.

Filed Nov. 15, 1971, Ser. No. 198,616
Int. Cl. B60r *27/00*
U.S. Cl. 280—150 R **9 Claims**



A protective device for preventing theft of vehicles, and particularly trailer-type vehicles, having an eye bolt adapted to be screwed in threaded engagement with a wheel member of the vehicle, a linking member which is looped through the eye of the eye bolt and around an accessible structural member of the vehicle, and a coupling element such as a lock for securing the linking member in a closed loop. The linking member is secured in the loop with sufficiently little slack that the eye bolt cannot be unthreaded from its engagement with the wheel, and so that the wheel can be rotated no more than a fraction of a revolution before being restrained from further rotation by the linking member.

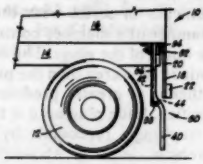
3,713,669
MUD FLAPS

James P. Evans, 3233 S.W. 23rd St., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 133,832, April 14, 1971. This application May 13, 1971, Ser. No. 143,069
Int. Cl. B62d *25/16*
U.S. Cl. 280—154.5 R **7 Claims**

Mud flap devices which are particularly adapted for use with truck trailers that are adjusted in what is known as the west coast setting of the rear or tandem wheels, that case where the wheels are set to the extreme rear of the trailer, such mud flap devices being characterized by a forward protruding transverse configuration which in the mounted position will be disposed adjacent the rear edge of the trailer

wheel and which will suspend a lower flap portion downward at a position several inches rearward of the vertical plane in which the forward protruding configuration lies. The mud flap



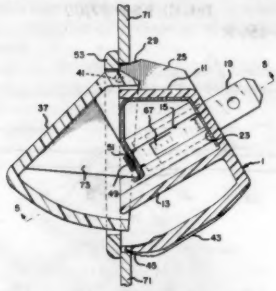
devices will then be secured ahead of the T-bar or bumper of the trailer and will include characteristic reenforcement devices to insure the proper transverse protruding portion and rearward-disposed suspended portions.

3,713,670

WATERPROOF ROCKER ARM SWITCH ASSEMBLY

Charles Edward Reynolds, Camp Hill, Pa., assignor to AMP Incorporated

Filed Jan. 4, 1972, Ser. No. 215,379
Int. Cl. H01h *9/04*
U.S. Cl. 200—168 G 10 Claims



A rocker arm switch, for use in appliances and the like such as a refrigerator, being normally biased in the on condition and being waterproof to the extent that it is capable of being placed in locations having a great deal of moisture and wherein the moisture will be required to travel uphill in order to short circuit a pair of conductors positioned in the switch or provide a current path out of the switch interior.

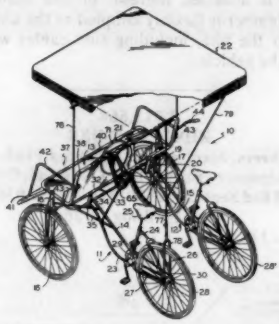
3,713,671

VELOCIPEDE AND CARRIER

Alfred N. Boyer, P. O. Box 102, Odell, Oreg.

Filed March 4, 1971, Ser. No. 121,065
Int. Cl. B62k *13/06*
U.S. Cl. 280—202 4 Claims

A velocipede has a generally triangularly shaped frame with a first portion oriented forwardly of the vehicle and a second portion disposed perpendicularly to the first portion and rigidly attached thereto. The second portion extends rearwardly of the vehicle and is adapted to seat a first rider for the vehicle. A pair of forward wheels are journaled from the first portion of the frame and are positioned substantially at the ends thereof. A driving wheel is journaled from the second portion of the frame. Pedal means on the second portion permit the rider to actuate the driving wheel. At least one tag-along frame having another driving wheel is universally jointed to the first portion of the frame and extends rearwardly of the vehicle for seating another rider in side-by-side relation with the first rider. The second portion of the vehicle frame and the tag-along frame are so positioned as to space the forward wheels relatively widely apart compared to the driving



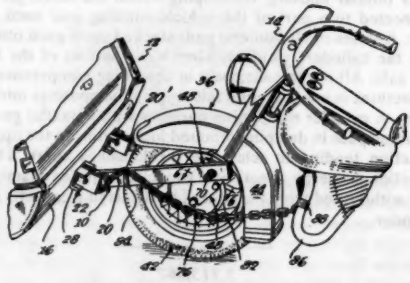
wheels. A seat is provided for at least one passenger above the pair of forward wheels. A shiftable steering wheel mounted on a crank hub on the first portion of the frame permits steering of the forward wheels by either rider.

3,713,672

MOTORCYCLE TO TOWING VEHICLE HITCH

Harold Robbins, 105 Graymoor Lane, Olympia Fields, Ill.

Filed Nov. 12, 1970, Ser. No. 88,902
Int. Cl. B62h *1/00*
U.S. Cl. 280—292 7 Claims



A hitch for towing a motorcycle by an automobile which comprises a pair of brackets mounted spaced along a horizontally arranged structural member, such as an automobile rear bumper, a pair of tow bars, each tow bar pivotally mounted to a respective one of said brackets to permit only vertical oscillation thereof, the opposite ends of each of said tow bars being secured at a second pivot connection likewise to permit only vertical oscillation, to a clamping means attached to the front fork of the motorcycle, whereby lateral movement of the front wheel of the motorcycle is prevented with resultant stability of the motorcycle during tow.

3,713,673

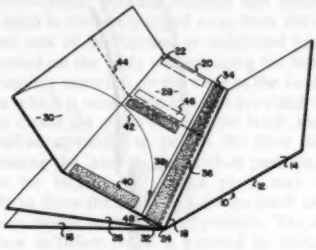
ENVELOPE-CONTAINING MULTIPLE PAGE PAMPHLET

Robert E. Katz, 17 Camelot Dr., Livingston, N.J.

Continuation-in-part of Ser. No. 125,213, March 17, 1971.
This application Nov. 8, 1971, Ser. No. 196,516
Int. Cl. B42d *1/00*
U.S. Cl. 281—3 R 18 Claims

An envelope-containing multiple-page pamphlet is formed with a sheet of paper having two longitudinal parallel folds extending the length thereof, a line of adhesive adjacent one of the folds secures the sheet to the pamphlet, and the two sec-

tions adjacent the second fold are secured to each other to form the envelope, one of the sections being wider than the



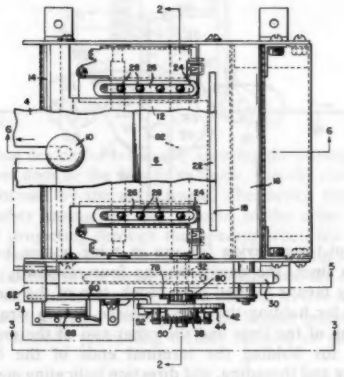
other and disposed between the two folds, the portion thereof adjacent the first fold being the flap of the envelope.

3,713,674

MACHINE FOR PRODUCING BUSINESS FORMS

Joseph Ray, Fallston, Md., assignor to American Totalisator Company, Inc., Towson, Md.

Filed Sept. 30, 1970, Ser. No. 76,804
Int. Cl. B41l *5/02*
U.S. Cl. 282—13 2 Claims



A hand-powered machine is provided for producing business forms retained in the machine with concurrent issuance of receipts to a customer, the machine being particularly adapted for the production of sweepstakes forms. Electrical control is provided by which the number of forms to be issued in a complete transaction may be determined by dialing.

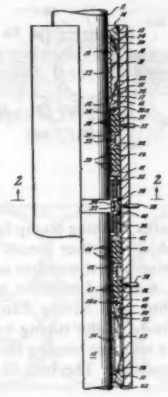
3,713,675

CONNECTOR FOR TUBULAR MEMBERS

William E. White, Jr., Houston, Tex., assignor to Hydro Tech Services, Inc., Houston, Tex.

Filed Jan. 15, 1971, Ser. No. 106,727
Int. Cl. F16l *35/00*
U.S. Cl. 285—3 8 Claims

A generally tubular housing arranged for positioning over the end of a tubular member has an inwardly facing annular tapered bowl formed therein. A segmented outwardly facing annular tapered bowl having a gripping surface on the outside surface thereof is arranged for axial and radially outward movement into engagement with the housing in response to an hydraulically generated axial face. Double tapered slips are annularly positioned between and matingly engage the bowls and are driven into engagement with the tubular member in response to axial movement of the segmented bowl. A pair of annular seals arranged for radial deformation into sealing engagement with the tubular members are carried by the housing and have an annular ring positioned therebetween arranged to communicate a pressurized test fluid to the seals after radial deformation thereof. The actuation forces for the segmented bowl and the seals are provided by circumferentially spaced



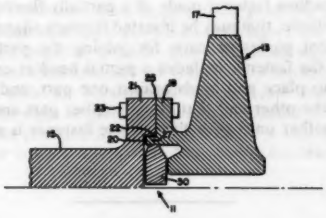
axially aligned cylinders having axially slidable pistons positioned in each end thereof. The central portion of each cylinder has an opening therein to allow introduction of a pressurized hardenable actuation fluid against the pistons and the central cylinder portion has a smaller diameter than that of the pistons to prevent flow of the hardened actuation fluid through the cylinders in response to movement of one piston subsequent to actuation.

3,713,676

PREDEFORMED RABBIT JOINT

Lawrence A. Carlstrom, Ballston Lake, N.Y., and George L. Padgett, Greenville, S.C., assignors to General Electric Company

Filed May 7, 1971, Ser. No. 141,330
Int. Cl. F16d *1/06*
U.S. Cl. 287—53 R 2 Claims



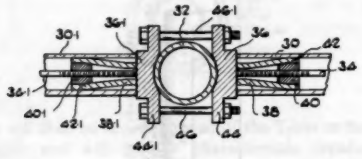
A rabbet joint and method of forming the rabbet joint, for connecting rotating components such as a turbine wheel and stub shaft, formed from different materials which have dissimilar coefficients of thermal expansion, whereby the component having a higher coefficient of thermal expansion is prestressed and elastically deformed by means of a plug insert, and then machined to fit the other component part.

3,713,677

TUBING CLAMPS

Jan Frederick Du Preez, 4 Saul Solomon Street, Vanderbijlpark, South Africa

Filed Feb. 4, 1971, Ser. No. 112,566
Int. Cl. F16b 7/00
U.S. Cl. 287—54 C 8 Claims



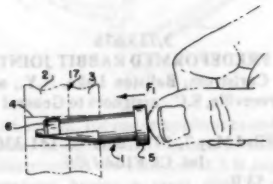
The invention concerns a tubing clamp for clamping a piece of tubing to a fixed object, further pieces of tubing, and the like. The clamp comprises a first member adapted to fit across the end of the tubing, a second member adapted to be positioned within the tubing and having flanges which are expanded against the inside of the tubing by nuts and the like threaded on a bolt-like member passing from the first member through the second member. The bolt-like member may be part of a turnbuckle.

3,713,678

FASTENER

Shirley McLarty, Hutchins, Tex., assignor to Cary Products, Inc., Hutchins, Tex.

Filed Dec. 7, 1970, Ser. No. 95,587
Int. Cl. F16b 5/02, 19/00
U.S. Cl. 287—189.36 D 6 Claims



A threadless fastener made of a partially flexible material, such as plastic, that may be inserted through aligned openings in adjacent pieces or parts for joining the parts together, wherein the fastener includes a partial head at one end that snaps into place and binds against one part, and includes a head at the other end that binds another part and holds the parts together until such time as the fastener is deliberately released.

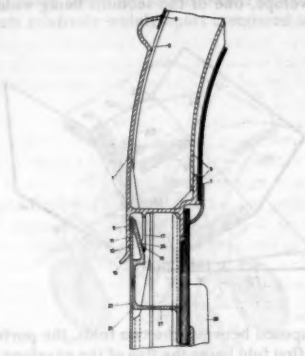
3,713,679

JOINT OF LIGHT METAL PARTS

Horst Beschmann, Waldhofstr. 8, 9240 Uzwil, and Ernst Wanner, zur Halde 556, 8222 Beringen, both of Switzerland

Filed March 17, 1971, Ser. No. 125,256
Int. Cl. F16b 5/08
U.S. Cl. 287—189.36 D 6 Claims

A joint made of light metal parts particularly suited for rail vehicles for attaching a prefabricated roof and pre-fabricated side walls or the like in which the joint is formed as a plug connection between one part having a wedge-shaped profile and a complementary slotted profile in the other part.

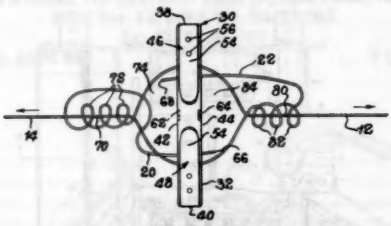


3,713,680

KNOT-TYPING DEVICE FOR BARREL KNOTS

Samuel J. Pagano, 45 Ochs Avenue, Milltown, N.J.

Filed Feb. 9, 1971, Ser. No. 113,887
Int. Cl. D03j 3/00
U.S. Cl. 289—17 20 Claims



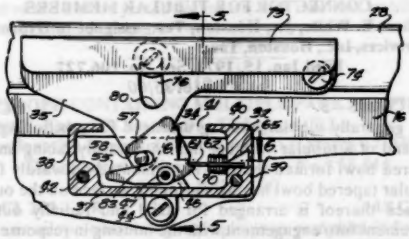
A knot-tying device for use in tying a true barrel knot between lines, the device having four resiliently releasable retaining means located on a block, two of the means being located for holding the lines in place during wrapping and threading of the lines and the other two of the means being located for holding the terminal ends of the lines after wrapping and threading, and direction indicating means for indicating the direction of threading for establishing a true barrel knot.

3,713,681

SAFETY LATCH ASSEMBLY FOR PICNIC COOLERS

Lauren D. Worley, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

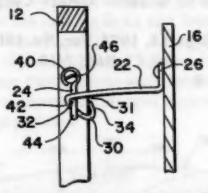
Filed Aug. 27, 1971, Ser. No. 175,470
Int. Cl. E05c 15/02, 19/02
U.S. Cl. 292—78 10 Claims



A safety latch for a picnic cooler permits the door of the cooler to be unlatched when pressure is applied to the door

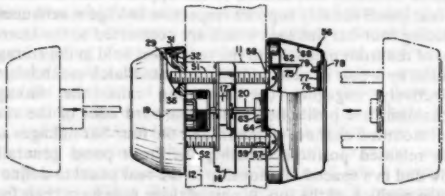
from inside the cooler and prevents the door from becoming inadvertently relatched when the door is closed. The latch assembly includes a latch mounted on the body of the cooler and rotatable over-center between latched and unlatched positions. The latch is resiliently urged away from the over-center position into one of the latched or unlatched positions by a spring mounted on the body and engaging the latch. A strike plate is swingably mounted on the door of the cooler and carries a strike which is receivable in a slot provided in the latch. As the door closes the strike engages the latch, and the strike plate is pushed upwardly to permit the door to be closed without rotating the latch to the latched position. When the door is to be locked, the strike plate may be pushed downwardly to force the strike against the latch and to rotate the latch over center to the latched position. The door can be opened when sufficient force is exerted to rotate the latch over center to the unlatched position.

3,713,682
LATCH-LOCK MECHANISM FOR CABINET DOOR
Arthur G. Feller, 2226 Williams Street, Fort Myers, Fla.
Filed April 26, 1971, Ser. No. 137,519
Int. Cl. E05c *17/36*
U.S. Cl. 292—80 **4 Claims**



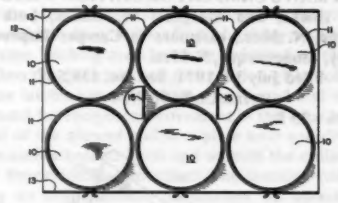
A latching device for releasably securing the unhinged side of a cabinet door or the like to its frame, thereby closing the opening formed by the door frame. The device includes a latch member having one end secured to the door with its other end projecting through the opening when the door is closed for engagement, upon opening the door, with a keeper member attached to the frame and extending into the opening. The latch member is provided with a hook at its free end having cam faces thereon which guide said keeper member into said hook, thereby preventing further opening or closing of the door.

3,713,683
THUMB TURN LOCK MECHANISM
Ralph E. Neary, San Francisco, Calif., assignor to Schlage Lock Company
Filed July 21, 1971, Ser. No. 164,693
Int. Cl. E05b *3/00*
U.S. Cl. 292—336.3 **12 Claims**



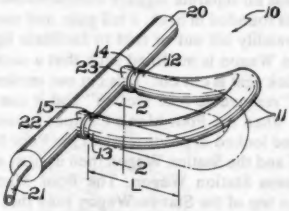
A thumb lock mechanism for mounting on a panel having a bore in which a rotatable bolt driver may be mounted includes a mounting plate having a bearing and fixed over one end of the bore by fasteners entering the bore and usually engaging a similarly mounted, key-operated device overlying the other end of the bore. A driver bar connects the key-operated device, the rotatable bolt driver and the hub of a rotor plate disposed in the mounting plate bearing. A turn piece peripherally engages the rotor plate and is formed with an extending turn and pull grip having a usually closed port overlying the fasteners. A yielding, axial retainer between the hub and the mounting plate urges detent on the mounting plate and rotor plate into engagement. A hold-back is optionally provided.

3,713,684
CONTAINER CARRIER
Ouglesa Jules Poupitch, 8501 West Higgins Road, Chicago, Ill.
Filed April 6, 1971, Ser. No. 131,625
Int. Cl. B66c *1/10*
U.S. Cl. 294—87.2 **8 Claims**



Formed wire ring carrier arrangements for retaining and transporting a plurality of containers.

3,713,685
FLEXIBLE ACTUATOR
Donald D. Ewing, Akron, Ohio, assignor to The B.F. Goodrich Company, New York, N.Y.
Filed Oct. 29, 1970, Ser. No. 85,197
Int. Cl. B66c *1/46*
U.S. Cl. 294—99 R **12 Claims**

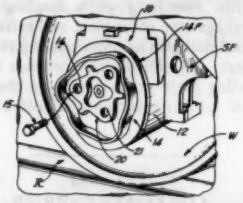


A tubular flexible actuator disposed in a generally U-shaped configuration with at least a portion of the legs of the actuator formed of elastomeric material with a common side of each leg having less than one-half the transverse periphery thereof reinforced with an inextensible but flexible longitudinal member. The ends of the actuator are connected to a source of fluid under pressure so that upon internal pressurization of the actuator it curls about the sides having the inextensible member.

3,713,686
LOCKING PLATE FOR AXLE END CAPS
Thomas A. Eddy, Mahwah, and Charles E. White, Franklin Lakes, both of N.J., assignors to Abex Corporation, New York, N.Y.
Filed Jan. 21, 1971, Ser. No. 108,335
Int. Cl. B60b *35/16*; F16b *39/02, 39/10*
U.S. Cl. 295—36 R **2 Claims**

Bolts used to secure the end of a bearing structure to the end of a railroad car axle are secured against loosening by the

conjoint action of bent tabs on a template and serrated openings in a juxtaposed lock plate fitted over the heads of the bolts.

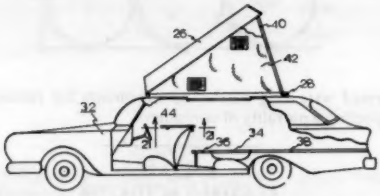


3,713,687

POOR MAN'S CAMPER FOR STATION WAGONS

Claud H. Hooks, and Margaret W. Hooks, both of Albuquerque, N. Mex., assignors to Camper Improvements Company, Albuquerque, N. Mex.

Filed July 14, 1971, Ser. No. 138,567
Int. Cl. B60p 3/34
U.S. Cl. 296—23 R **1 Claim**



The "Poor Man's Camper for Station Wagons" is essentially a rectangular shaped box, that has no bottom, mounted on top of a modified Station Wagon. A Station Wagon as defined in Webster's Dictionary is "an automobile that resembles a sedan but has no separate luggage compartment and has a top (that is) less rounded in back, a tail gate, and one or more rear seats that readily lift out or fold to facilitate light trucking." The Station Wagon is modified such that a section of it's top over the back seat is cut out. This cut out section of the top is called the "removable roof section" and it can be taken out and stored when the Poor Man's Camper is used or it can be replaced and locked in position when the Poor Man's Camper is removed and the Station Wagon then used as a regular family or business Station Wagon. The Poor Man's Camper is mounted on top of the Station Wagon such that it provides an air/water tight seal with the top of the Station Wagon with latches joined to secure it into its traveling configuration. It is hinged at one end such that the other end may be raised and secured in position for the camping configuration. Curtains are dropped from the lid and secured in position to provide privacy and protection from the elements of weather. The back seat is folded down to provide the floor on which a person stands while undressing, dressing or cooking meals, etc. The Station Wagon's permanent rear floor bed plus any desired portion of the folded down floor is used as a surface for bedding to sleep on.

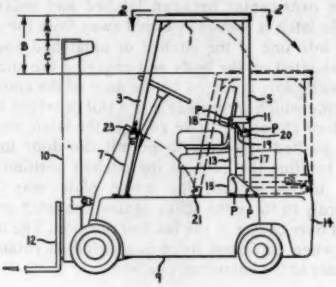
3,713,688

MULTIPLE POSITION OVERHEAD GUARD

James G. Monroe, Portland, Oreg., assignor to Hyster Company, Portland, Oreg.

Filed Oct. 27, 1970, Ser. No. 84,395
Int. Cl. B62d 25/06
U.S. Cl. 296—107 **1 Claim**

A multiple position overhead guard for an industrial truck is disclosed. The present embodiment shows an upright position and a lowered position. In its lowered position, the overhead guard permits the industrial truck to negotiate entrances having restricted overhead clearance. In both positions the guard may be secured rigidly to the truck chassis.

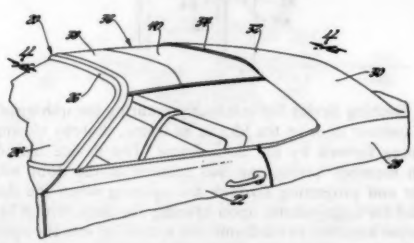


3,713,689

VEHICLE BODY RETRACTABLE TOP

Edward G. Podolan, and Francis C. Przybysz, both of Utica, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 14, 1971, Ser. No. 180,409
Int. Cl. B60j 7/10
U.S. Cl. 296—137 B **5 Claims**



A vehicle body includes a fixed roof panel adjacent the rear end of the occupant compartment and cooperable with the windshield header to define an occupant compartment roof opening selectively closed by a retractable top including movable front and rear roof panels. A pair of mounting rails have their forward ends affixed to the opposite lateral sides of the rear panel while their rearward ends support respective pairs of rollers received within respective body mounted channel members to mount the rear panel for generally translatory movement between a rearward storage position below the fixed roof panel and a forward raised position closing the rear portion of the roof opening. A pair of longitudinally extending channel members also affixed to the opposite lateral sides of the rear panel slidably support respective linkage mechanisms including four-bar linkages which are connected to the lateral sides of the front panel. With the rear panel held in the storage position by a pair of vehicle body mounted latch mechanisms respectively engaging the mounting rails, the linkage mechanisms are positioned at the rearward ends of the rear panel mounted channel members and the four-bar linkages assume released positions locating the front panel generally below and in a spaced relationship to the rear panel to define a storage position of the top. A pair of drive rails have their forward ends pivoted to respective locking links of the linkage mechanisms and have their rearward ends supported by roller arrangements movable longitudinally relative to the vehicle body along body mounted channel members. Conventional cable drive mechanisms connected to the roller arrangements are actuatable to move the drive rails forwardly and slide the

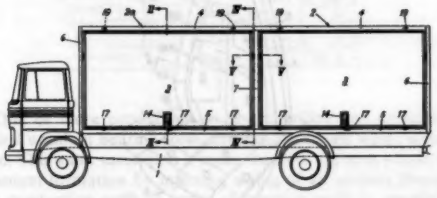
front panel and linkage mechanisms forwardly along the stationary rear panel while control linkages of the linkage mechanisms maintain the four-bar linkages in the released positions and the locking links also in respective released positions. When the linkage mechanisms reach the forward ends of the rear panel mounted channel members, the control linkages allow the forwardly moving drive rails to move the four-bar linkages to locked positions and bodily shift the front panel upwardly to seal the panels and align respective front and rear drip rail portions on the opposite sides of the panels. As the four-bar linkages move to the locked positions, the locking links are moved to overcenter locking positions and pin and open ended slot connections between the drive rails and linkage mechanisms are interengaged to provide a driving connection between the drive rails and the linkage mechanisms. The latch mechanisms holding the rear panel in the storage position are cammed to unlatched positions concomitant with the locking of the locking links and four-bar linkages and allow the drive mechanisms to move the front and rear panels forwardly as a unit until the front panel engages the windshield header to thus provide a raised position in which the top closes the roof opening. The drive mechanisms are also actuatable to move the front and rear panels from the raised position rearwardly, with the panels moving as a unit until the rear panel reaches the storage position where the pin and slot connections are cammed out of engagement and move the locking links and four-bar linkages to the respective released positions. Thereafter, the drive mechanisms move the downwardly shifted front panel rearwardly as the linkage mechanisms slide rearwardly along the stationary rear panel mounted channel members and the top moves to the storage position.

3,713,690

VEHICLE BODY BOX EQUIPPED WITH AT LEAST ONE SLIDING DOOR

Lutz Knothe, Lengnau, and Engelbert Loeblein, Biel, both of Germany, assignors to Ramseier & Jenzer A.G. Bern, Bern, Switzerland

Filed May 17, 1971, Ser. No. 143,819
Int. Cl. B60j *5/04*
U.S. Cl. 296—146 **7 Claims**



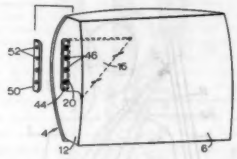
A box construction for a vehicle equipped with at least one sliding door which when in its closed position is located in the same plane as a stationary wall located adjacent thereto or as a second sliding door which when in its closed position is similarly located adjacent thereto. The invention contemplates the provision of a mechanism for each sliding door and cooperating with stationary components of the vehicle box and serving to permit displacement of such sliding door out of its closed position, while simultaneously lowering same through an amount greater than its thickness, into a preparatory position. When the sliding door is in such preparatory position, then, displaceable traveling rollers mounted at the sliding door and located over such sliding door bear in freely suspended fashion upon a stationary linear rail located at the edge of the roof of the vehicle box, and the aforesaid mechanism enables the sliding door to again be raised out of its preparatory position and placed back into its closed position.

3,713,691

VEHICLE DOOR COLLISION PLATE AND LATCH

Jay J. Bayless, 1921 Colorado Street, Topeka, Kans.

Filed Feb. 10, 1971, Ser. No. 114,110
Int. Cl. B60j *7/18*
U.S. Cl. 296—152 **10 Claims**



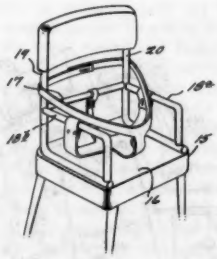
A collision plate having a collision plate hole is bolted to the inside of a vehicle door. A door frame latching member having a door frame latching member hole is bolted to the vehicle frame. When the door is closed the collision plate hole and the door frame latching member hole are aligned and a latching rod, mounted for reciprocal movement in the door, can move in and out of the aligned collision plate hole and door frame latching member hole to latch and unlatch the collision plate and door frame latching member. The latching rod may be moved by an inside handle mechanism, an outside handle mechanism or a rod handle.

3,713,692

HARNESS FOR RESTRAINING A CHILD IN A CHAIR

Madelyn Iris McCracken, 2008 Bluebird Lane, Altus, Okla.; Glenn Ray Randolph, 605 West 19th, and Dwight Wayland Watkins, 1429 Piedmont, both of Clovis, N. Mex.

Filed March 2, 1971, Ser. No. 120,158
Int. Cl. A47d *15/00*
U.S. Cl. 297—385 **2 Claims**

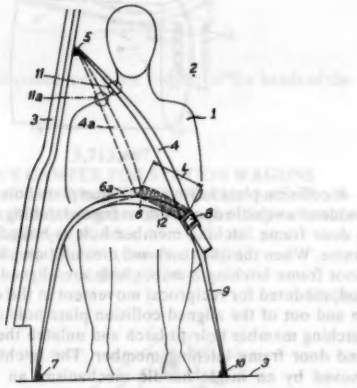


A harness for restraining the movement of an infant or small child who is seated in a chair. The seating portion of the harness is secured to the back of the chair by a strap. When the baby is placed upon the seating portion, a forwardly extending strap is brought up between the infant's legs and looped backwards towards the back of the chair. The straps which extend laterally from the forwardly extending strap are then passed under the infant's arms and around the infant's midsection and connected again at the back of the chair. Straps also extend laterally from the seating portion of the harness and these straps are secured to the side frame members of the chair to prevent lateral movement of the harness in response to the infant's movements.

3,713,693
CAR SAFETY BELTS

Jean Georges Cadiou, Paris, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Aug. 4, 1971, Ser. No. 168,833
Claims priority, application France, Sept. 2, 1970, 7031952
Int. Cl. A62b *35/60*
U.S. Cl. 297—389 2 Claims

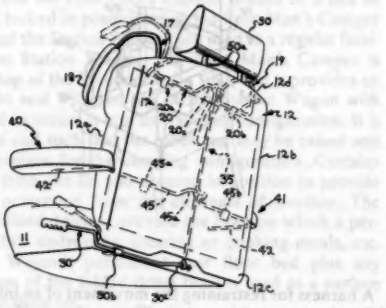


This invention relates to a car safety belt, constituted by a diagonal element combined with a subabdominal element by a means for selectively maintaining the orientation of the two elements of the belt and by a buckle, the means for maintaining the orientation of the two elements being constituted by a sleeve which concomitantly envelops the elements, one of the ends of which abuts on the buckle and the other end of which holds the zone of intersection of the two elements in the preferred position.

3,713,694
BODY RESTRAINING DEVICE FOR VEHICLE

Ralph A. Miller, 3832 Burton St., Toledo, Ohio

Filed April 20, 1971, Ser. No. 135,576
Int. Cl. A62b *35/60*
U.S. Cl. 297—390 8 Claims

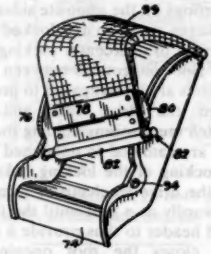


An improved seat construction for vehicle occupants which comprises, in addition to the usual horizontal platform and upstanding back support, a hand-operable lever arm and a pair of shoulder restraining members, the latter being connected via a connector rod to the former whereby shifting of the lever arm causes the shoulder restraining arms to shift between an operative occupant restraining position and an inoperative position, in which the occupant is not restrained, for convenience of ingress and egress of the occupant; said device including, in a preferred embodiment, a shiftable armrest arrangement.

3,713,695
SAFETY DEVICE FOR RESTRAINING PASSENGERS

Heinrich F. Von Wimmersperg, 15929 Grand River Ave., Detroit, Mich.

Filed Aug. 27, 1971, Ser. No. 175,659
Int. Cl. B60r *21/02*
U.S. Cl. 297—384 22 Claims

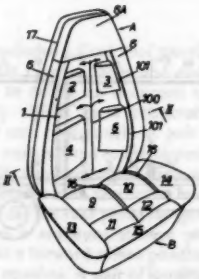


A safety seat for vehicles which incorporates a head-restraining member comprising a sheet of flexible material which is yieldable or stretchable but generally non-elastic. The head-restraining sheet is secured to the safety seat so as to extend downwardly in front of the passenger's head. The sheet gradually absorbs the momentum of the passenger's head and provides a progressively increasing contact area with the passenger's head and face to minimize the peak unit load.

3,713,696
VEHICLE SEAT CONSTRUCTION

Richard Dudley, Harlington, England, assignor to General Motors Corporation, Detroit, Mich.

Filed May 20, 1971, Ser. No. 145,160
Int. Cl. A47c *27/14*, *27/22*; B60n *1/06*
U.S. Cl. 297—452 8 Claims



A vehicle seat bottom or back squab comprises a pan having a plurality of separate pads attached thereto. These pads may be spaced apart to leave a channel or channels. Each pad may be located by inter-fitting with a shaped part of the pan. Portions of the pan may be cut away to form resilient cantilever portions, carrying padded material.

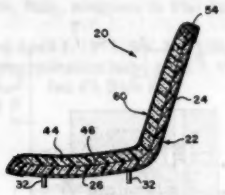
3,713,697
CHAIR CUSHION AND METHOD OF MAKING SAME

Earl H. Koepke, Chagrin Falls, Ohio, assignor to The General Fireproofing Company, Youngstown, Ohio

Filed May 4, 1971, Ser. No. 140,040
Int. Cl. A47c *7/02*, *3/00*
U.S. Cl. 297—456 1 Claim

A rigid shell is formed including a back rest and a seat portion. A resilient cushion portion is formed and adhesively

bonded to the shell. A cover is placed on an upholstery form and the shell and cushion are attached to a member of a press. Adhesive bonding means is applied to the cushion portion and



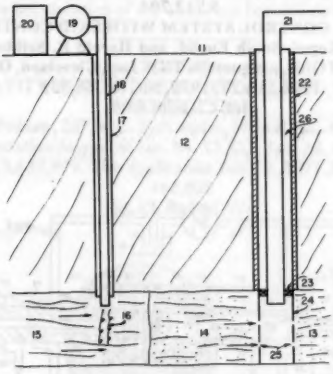
the cover and the cushion portion and shell are then pressed into contact with the cover. The edge portions of the cover are then adhesively bonded to the shell and the completed chair cushion is removed from the press member.

3,713,698

URANIUM SOLUTION MINING PROCESS

Vaughan W. Rhoades, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed March 30, 1971, Ser. No. 129,415
Int. Cl. E21b *43/28*
U.S. Cl. 299—4 **9 Claims**



One or more production wells are drilled and completed into a uranium bearing formation having a high water saturation. The water saturation is removed from the area within the uranium formation by injecting a slug of an oxidant through the production wells. A series of injection wells is completed in the peripheral edge of the oxidant bank so that a leaching solution is injected into the water bank built up during oxidant injection. The solutions contact and react with the uranium mineral and oxidant to form soluble uranium salts which are produced from the production wells.

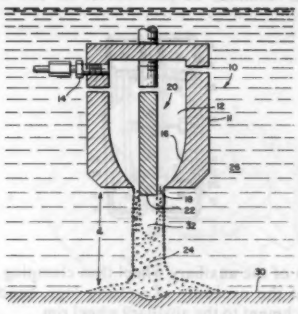
3,713,699

SYSTEM FOR ERODING SOLIDS WITH A CAVITATING FLUID JET

Virgil E. Johnson, Jr., Gaithersburg, Md., assignor to Hydronautics, Incorporated, Laurel, Md.

Continuation-in-part of Ser. No. 12,449, Feb. 18, 1970, which is a division of Ser. No. 745,611, July 17, 1968, Pat. No. 3,528,704. This application Aug. 26, 1971, Ser. No. 175,150
Int. Cl. E21c *37/06*
U.S. Cl. 299—14 **12 Claims**

An improved system for advantageously utilizing the destructive forces of cavitation for the erosion of solids which comprises forming a fluid jet by directing a fluid through a restricted orifice at a speed sufficient to form vapor cavities in



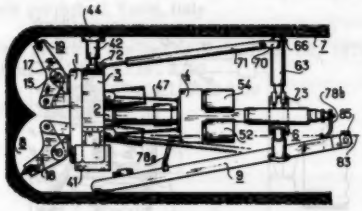
the fluid jet, surrounding the fluid jet with a liquid medium, and impinging the fluid jet against the solid at a distance from the orifice where the vapor cavities collapse.

3,713,700

UNIVERSAL CONTINUOUS BORING MACHINE

Marcel Montacie, Paris, France, assignor to Union Industrielle Blanzy-Ouest, Paris, France

Filed Nov. 4, 1970, Ser. No. 86,923
Claims priority, application France, Nov. 4, 1969, 6937879
Int. Cl. E01g *3/04*
U.S. Cl. 299—31 **24 Claims**



Tools mounted on swinging arms are fixed to a rotating head which, in turn, is carried by a front casing. A rear casing is coupled to the front casing and forms a chassis through parallel longitudinal members which are fixed to the front casing and are slidably received by the rear casing permitting relative longitudinal movement between the front and rear casings. A guide carriage is slidably coupled to the ends of the parallel members which protrude rearwardly of the rear casing. The head is selectively rotated and the arms carrying the tools are oscillated by a drive mechanism carried by the rear casing. Bearing jacks carried by the guide carriage selectively fixes the carriage at a given longitudinal position, while pushing jacks carried by the carriage and acting on the front casing advances the front casing when the carriage is longitudinally stopped in fixed position by the bearing jacks.

3,713,701

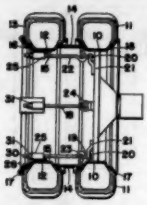
DETACHABLE AUXILIARY TRACTOR TIRE AND WHEEL ATTACHMENT MEANS

John Penner, 109 Clearwater Road, Winnipeg, Manitoba, Canada

Filed Nov. 22, 1968, Ser. No. 778,108
Claims priority, application Great Britain, Feb. 17, 1968, 7,896/68
Int. Cl. B60b *1/06*
U.S. Cl. 301—39 R **7 Claims**

Means for detachably securing auxiliary tire and rim assemblies to the rear wheels of tractors utilizing modified wheel

nuts for the main wheel attachment which enables bolts to be hooked to these nuts and extend to clips which engage over



the outer rim of the auxiliary wheel thus clamping one to the other without the necessity of welding lugs, beads or other forms of attachment to the auxiliary wheel rim.

3,713,702

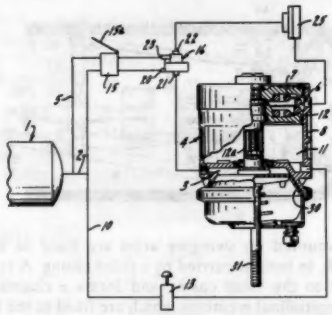
MODULATED SPRING BRAKE

Sergio Campanini, Lincolnwood, Ill., assignor to The Berg Manufacturing Company, Des Plaines, Ill.

Continuation of Ser. No. 854,605, Sept. 2, 1969, abandoned, and a continuation of Ser. No. 73,555, Sept. 18, 1970, abandoned. This application Feb. 2, 1971, Ser. No. 112,057

Int. Cl. B60t *13/40, 15/00*

U.S. Cl. 303—9 **9 Claims**



In a vehicle brake system having a service brake actuating chamber and a spring-applied, fluid pressure emergency brake-actuating chamber, a system supplying fluid pressure to the spring side of the movable wall in the emergency chamber in response to loss of pressure to the service chamber and operation of the brake application valve.

3,713,703

SHUTTLE VALVE

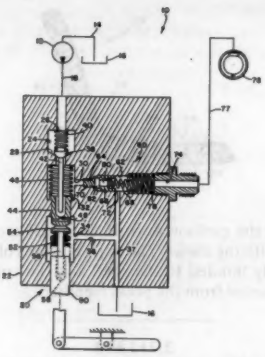
Max Murrow Brown, Seminole, Fla., assignor to Deere & Company, Moline, Ill.

Filed March 11, 1971, Ser. No. 123,356

Int. Cl. B60t *13/18, 15/04*

U.S. Cl. 303—10 **1 Claim**

The return of actuating fluid from a vehicle brake is diverted to a sump-connected bypass line and is prevented from returning through the brake control valve by a shuttle valve which is interposed in the brake line between the brake and the control valve. The shuttle valve shifts in response to the fluid pressure in the brake line to connect fluid pressure to the brakes and block the bypass line when the control valve is



positioned for actuating the brake and to block the brake line and open the bypass line when the control valve is positioned for deactivating the brake.

3,713,704

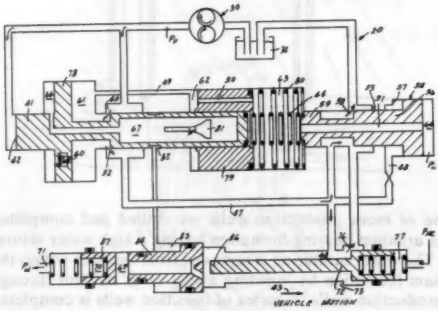
BRAKE CONTROL SYSTEM WITH SKID CONTROL

Ernest R. Koppl, South Euclid, and Harold R. Scibbe, Chardon, all of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed July 27, 1970, Ser. No. 58,535

Int. Cl. B60t *8/08*

U.S. Cl. 303—21 B **7 Claims**

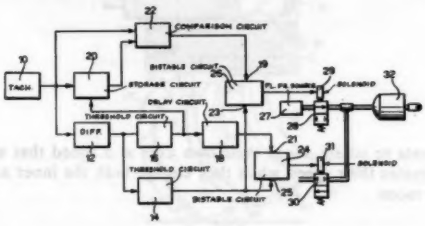


Wheel velocity is monitored and at the onset of brake application, the system commits wheel velocity signal to memory as a vehicle velocity signal. During brake application, the wheel velocity signal is scaled to appear a fractional part greater than it actually is. As braking lowers actual wheel velocity to a fixed fraction of that remembered vehicle velocity, the upward biased wheel signal will equal the remembered signal. This equality means that the wheel is at a fixed fraction of vehicle speed, hence at a fixed wheel slip percentage. Thereafter, error in the signal balance or equality is used to adjust a modulating device which raises or lowers braking torque to remove or minimize that error. Such modulation of the braking torque adjusts the wheel speed to maintain a fixed proportionality to vehicle speed. By integrating the motion of an inertial mass in the system, vehicle velocity is constantly updated throughout the vehicle deceleration.

3,713,705
ANTISKID BRAKING METHOD AND APPARATUS

Giancarlo Michellone; Mario Palazzetti, and Giovanni Tabasso, all of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed April 1, 1971, Ser. No. 130,365
Claims priority, application Italy, April 7, 1970, 68157 A/70
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 P 2 Claims

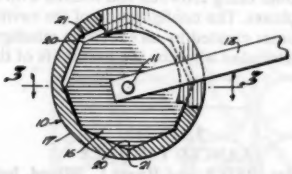


A vehicle anti-skid braking system shortens the time required to reduce an excessive slip of the wheel by ascertaining the instant when the wheel acceleration becomes zero after braking pressure has been released and by keeping constant the braking torque on the wheel at the value it reaches after a predetermined time has elapsed from such instant, braking being resumed when the wheel speed has increased by a predetermined amount from the value it had at the instant when the deceleration of the wheel has become zero.

3,713,706
GRAVITY-ACTUATED SELF-PROPELLING WHEEL CONSTRUCTION

Aime Trudeau, 227 N. E. 26th Street, Miami, Fla.

Continuation-in-part of Ser. No. 13,522, Jan. 24, 1970, Pat. No. 3,633,979. This application July 12, 1971, Ser. No. 162,025
Int. Cl. B62d *57/00*
U.S. Cl. 305—7 1 Claim



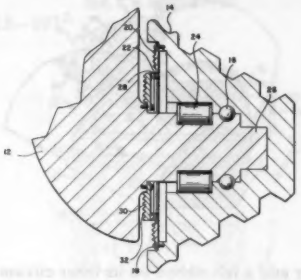
An inner wheel having a polygonal periphery is arranged for planetary motion within and with respect to the inner polygonal periphery of an annular outer wheel of substantially greater inner diameter than the outer diameter of the inner wheel. The inner wheel is journalled with respect to a carriage structure whereby, upon the carriage structure being propelled either forwardly or backwardly, the inner wheel rides up within the outer wheel to impose a gravitational force therebetween aiding in the propulsion of the carriage structure.

3,713,707
BEARING SEAL

John D. Bennett, Richardson, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.

Filed Jan. 12, 1970, Ser. No. 2,210
Int. Cl. F16c *33/78*
U.S. Cl. 308—8.2 9 Claims

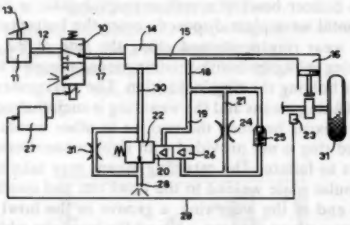
A bearing seal especially useful in drill bits is arranged so that the heat emanating from the friction created by rotation of one part about another is substantially reduced before reaching the sealing element. This is accomplished by dissipating the heat into the surrounding environment through a thin metallic element located in the heat path preceding the sealing element. Additionally, the heat path is arranged to be circuitous so that the heat has a long pathway in contact with the surrounding environment.



3,713,708
METHOD AND APPARATUS FOR THE ANTI-SKID BRAKING OF A VEHICLE WHEEL

Giancarlo Michellone, Cambiano; Gilberto Maurizio; Giuseppe Calcia, both of Turin; Dario Brandino, Moncalieri, and Mario Palazzetti, Turin, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Jan. 19, 1971, Ser. No. 107,660
Claims priority, application Italy, Jan. 30, 1970, 67281 A/70; Jan. 30, 1970, 67282 A/70
Int. Cl. B60t *8/04*
U.S. Cl. 303—21 F 5 Claims



In anti-skid braking of a vehicle wheel, in which the braking force is decreased and increased repeatedly during one braking operation in accordance with the dynamic condition of the wheel, the braking force is each time decreased at a substantially instantaneous rate and by a fixed decrement which is not less than the value of pressure that would cause the wheel to lock when the vehicle is braked on slippery ground.

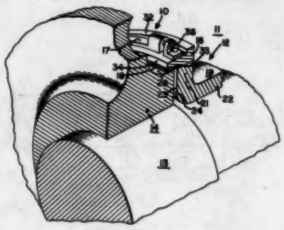
3,713,709
RESILIENT AXLE LINING DUST GUARD

William C. Staiger, Erie, Pa., assignor to General Electric Company

Filed Nov. 18, 1971, Ser. No. 199,969
Int. Cl. B60b *35/00*; F16c *33/72*; F16j *15/02*
U.S. Cl. 308—36.1 6 Claims

A dust guard seal for bridging the axial gap between an annular thrust flange of a traction motor cylindrical bearing and the hub of a locomotive wheel supported by the bearing. A

cylindrical elastomeric collar has near its one end an adjustable band circumferentially securing it to the thrust flange, and near its other end a felt ribbon on its inner circumference to frictionally engage the wheel hub surface, thereby preventing the entrance of dirt particles into the axial gap.



3,713,710

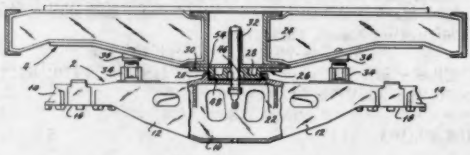
RAILWAY CAR CENTER BEARING

George O. Wallace, St. Louis, Mo., assignor to Diversified Industries, Inc., St. Louis, Mo.

Filed Feb. 16, 1971, Ser. No. 115,178

Int. Cl. B61f *5/14, 5/18;* F16c *17/04*

U.S. Cl. 308—137 **15 Claims**



The bolster bowl of a railcar truck bolster is lined with a horizontal wear plate disposed across the bottom of the bowl and a wear ring positioned along the side of the bowl. The wear ring is engaged with retaining means carried by the bowl rim for holding the ring in position. The engagement between the retaining means and the wear ring is such that no rigid connection exists between the two, or in other words the highly stressed ring is not provided with rigid connections which are subject to failure. The retaining means may take the form of an annular plate welded to the bowl rim and overlapping the upper end of the wear ring, a groove in the bowl rim which receives a rib on the ring, a rib on the bowl rim which engages and projects into a groove on the ring; and a backing ring surrounding the wear ring and connected thereto through an intervening elastomeric layer. Also, the wear ring at its lower end may turn under the wear plate so that the weight of a railcar body on the wear plate will hold the wear ring in place.

3,713,711

ROLLING CONTACT BEARING ACCELERATOR

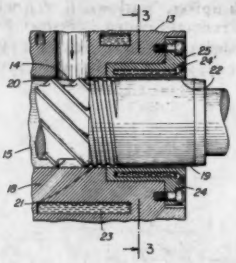
Val Cronstedt, Williamsport, Pa., assignor to Avco Corporation, Williamsport, Pa.

Filed May 3, 1971, Ser. No. 139,646

Int. Cl. F16c *33/66*

U.S. Cl. 308—187 **1 Claim**

The disclosure illustrates a bearing assembly comprising inner and outer races and a plurality of rolling elements positioned between the races for circumferential movement. The bearing normally has a clearance between the rolling elements and the races and is intermittently subjected to radial loads. A retainer which spaces the rolling elements carries a series of turbine buckets. Fluid is directed in the form of a jet against the buckets to rotate the retainer about its axis at a rate intermediate of the inner and outer races. This causes the rolling elements to rotate about their own axes at a speed that approximates their speed when they engage both the inner and outer races.



3,713,712

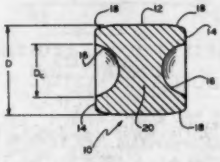
HOLLOW ENDED BEARING ROLLER

William J. Derner, Manlius; Harold E. Stewart, Central Square; Lawrence E. Root, Jamesville, and Roger A. Goodelle, Liverpool, all of N.Y., assignors to Rollway Bearing Company, Inc., Liverpool, N.Y.

Filed March 29, 1971, Ser. No. 128,983

Int. Cl. F16c *33/00*

U.S. Cl. 308—215 **3 Claims**



A hollow ended roller element for use in radial and thrust bearings, the roller being crowned and formed with cavities in both terminal planes. The configuration of the cavities is such that unequal forces created by an excessive misalignment are more evenly distributed whereby the useful life of the bearing is extended.

3,713,713

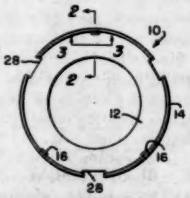
LANCED TAB RACE

Richard L. Alling, RFD 1, and Roger L. Iffland, both of Torrington, Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Dec. 30, 1971, Ser. No. 214,260

Int. Cl. F16c *33/64*

U.S. Cl. 308—235 **19 Claims**



A thrust bearing race is disclosed which employs lanced tabs to retain the cage assembly. The structure of the tabs facilitate assembly and provide improved retention of the assembly. Cut-outs in the flange are also provided to improve lubrication and provide clearance at assembly.

3,713,714

METHODS OF MANUFACTURING FLANGED BEARINGS

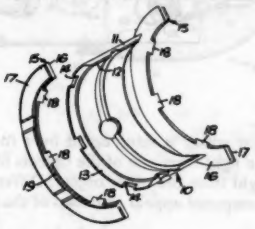
Joseph Henry Hill, Greenford; Geoffrey Philip Keeling, and Roger Hugh Spikes, Marlow, all of England, assignors to Vandervell Products Limited, Berkshire, England

Filed Aug. 9, 1971, Ser. No. 170,255

Claims priority, application Great Britain, Sept. 25, 1970, 45,904/70

Int. Cl. F16c *33/14*

U.S. Cl. 308—237 13 Claims



A flanged bearing has a thin wall flexible bearing liner and end flanges formed as separate components. The flanges are attached to the liners by radial lugs on the inner peripheries of the flanges which engage in slots in the axial ends of the liner so that the curvature of the liner can vary with respect to the flanges. Outwardly projecting stakes are formed in the end edges of the liner to prevent the flanges disengaging axially from the liner while permitting limited axial float of the flanges with respect to the liner.

3,713,715

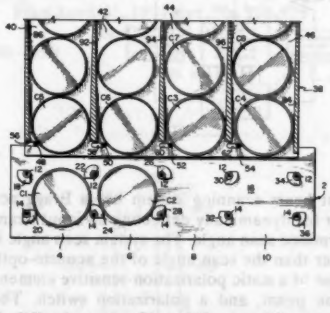
ARTICLE DELIVERY SYSTEMS FOR VENDING MACHINES

John J. Rakucewicz, Northport, N.Y., assignor to Kinematics and Controls Corporation, New York, N.Y.

Filed July 6, 1970, Ser. No. 52,477

Int. Cl. A47f *1/00*, *3/02*; B65g *59/00*

U.S. Cl. 312—45 9 Claims



An article delivery system for vending machines comprising a vending mechanism and a vend rack. The vending mechanism comprises a plurality of vending columns, each having a gate which is disposed out of phase a predetermined amount with at least one other gate, and which is moveably affixed with respect to a vending column. When the gate is in a closed position the articles may be retained in and above the vending mechanism. By periodically causing the gates to move a predetermined amount, one gate will be selectively moved to an open position during each vending cycle such that the articles in and above the vending mechanism may be sequentially vended. The vend rack may be affixed to the vending machine, or comprise a plurality of portable vend rack modules.

3,713,716

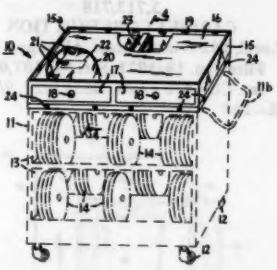
ADAPTOR FOR TAPE TRANSPORT TRUCK AND THE LIKE

Hanns G. Stenger, 70-11 34th Ave., Jackson Heights, N.Y.

Filed Feb. 24, 1971, Ser. No. 118,223

Int. Cl. A47b *87/00*

U.S. Cl. 312—107 3 Claims



An adaptor for tape transport trucks and similar carts of the type generally employed in computer installations is provided having means for retaining labels, identification cards, and the like, in an orderly arrangement as well as storing therein miscellaneous business items such as rubber bands, paper clips, marking pencils, and the like. The adaptor of the invention is designed so that it can be detachably secured to tape transport trucks, carts, or similar vehicles with the upper portion thereof being a planar surface which can be used as a writing area, and which can be provided with a lip so that additional tapes or similar articles can be temporarily stored on the planar surface.

Although the adaptor of the invention is designed to be utilized in conjunction with tape transport trucks and carts, it can also be employed as a separate unit since it is provided with means for detachably securing it to such tape transport trucks and carts.

3,713,717

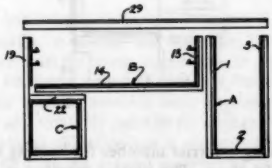
BODY CONSTRUCTION

Oliver B. Hafner, Birmingham, Ala., assignor to Altec Manufacturing Company, Inc., Birmingham, Ala.

Filed June 25, 1971, Ser. No. 156,850

Int. Cl. A47b *19/00*

U.S. Cl. 312—195 12 Claims



The disclosure hereof is related to body construction and particularly to such bodies as are used in trucks and provide for storage space and areas at opposite sides of a platform for accessibility from the ground at opposite sides of the truck or the like upon which the body is mounted. Further, the concept is to form the body hereof in body units which themselves are arranged to be positioned at opposite sides of a platform assembly, such side units in turn being comprised of modular elements or modules, which may be assembled to form different combinations of storage areas, the assembly being effected in such a manner as to conceal the manner of assembly primarily to prevent deterioration of the same by the elements, the formation of the modules themselves being facilitated by reason of the substantially identical transverse cross-sectional configuration of the material from which the

modules are formed, it being disclosed how modules of different forms can be assembled, the cross-sectional configuration of the material from which the modules are formed being arranged to provide for recessing of access doors and like members further adding to the resistance of the arrangement to the effect of elements thereon.

3,713,718

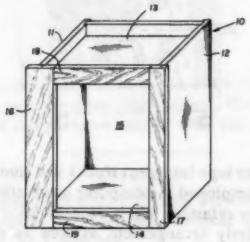
CABINET CONSTRUCTION

Donald E. Lucci, 152 Winter Street, Aliquippa, Pa.

Filed Jan. 18, 1971, Ser. No. 107,087

Int. Cl. A47b *47/04*; B65d *9/22*, *9/34*

U.S. Cl. 312—263 **10 Claims**



A new cabinet design is disclosed providing for an interlocked assembly of a cabinet structure from premachined wall elements, rails and stiles; said premachining requiring a minimum of machine settings; and it being possible to effect said assembly without tools.

3,713,719

HOUSEHOLD APPLIANCE SUCH AS A COOKING STOVE OR THE LIKE HAVING BALLAST MEANS

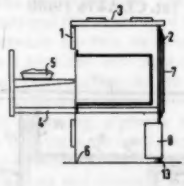
Heinrich Detterbeck, Traunreut, Germany, assignor to Siemens-Electrogerate GmbH, Berlin and Munich, Germany

Filed Jan. 27, 1971, Ser. No. 110,106

Claims priority, application Germany, Jan. 28, 1970, P 20 03 673.1

Int. Cl. A47b *97/00*; F24c *1/00*

U.S. Cl. 312—352 **9 Claims**



A stove having a carrier member for holding a charge to be placed into the stove. The carrier member is connected to guide members via a carrier frame and enables the carrier member to be positively positioned in front of the stove. Supports at the rear of the stove are provided to seat and receive a flat ballast means to impart stove stability.

3,713,720

MICROSCOPIC OPTICAL COMPARISON DEVICE

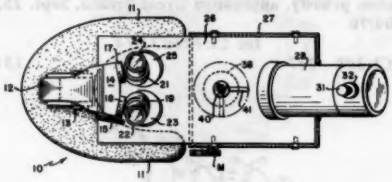
Dwin R. Craig, Gaithersburg, Md., assignor to Symbionics, Inc., Annapolis, Md.

Continuation-in-part of Ser. No. 803,250, Feb. 28, 1969, abandoned. This application Sept. 14, 1970, Ser. No. 71,641

Int. Cl. G02b *21/20*

U.S. Cl. 350—30 **4 Claims**

A microscopic optical comparison device in which objects to be compared are arranged in side by side relation and when viewed through a binocular microscope system are caused to appear as one object with each object being viewed by a respective one of the observers eyes. The objects are intermittently and successively illuminated from a substantially point



source of light which is intercepted by a rotating shutter to first block the light from one of the objects following which it blocks the light from the other object. Differences in the objects being compared appear as pulses of the missing detail of the object.

3,713,721

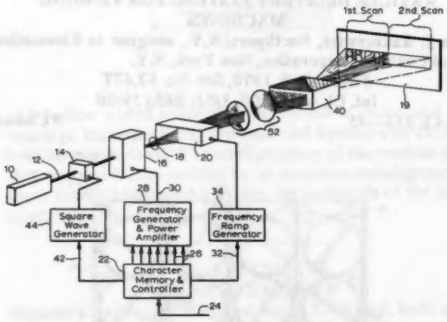
POLARIZED LIGHT BEAM SCANNING WITH IMPROVED ANGULAR RESOLUTION

William H. Watson, Roselle, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 14, 1972, Ser. No. 225,744

Int. Cl. G02f *1/26*

U.S. Cl. 350—150 **8 Claims**



A light beam scanning system has a Bragg acousto-optic deflector for dynamically deflecting an input beam through a predetermined scan angle. The system scan angle is caused to be greater than the scan angle of the acousto-optic deflector by the use of a static polarization-sensitive element, such as a Wollaston prism, and a polarization switch. The deflector transmits the beam in a first direction when the beam has a first polarization state and in a second direction when the beam has a second polarization state. The polarization switch switches the polarization of the beam from the first polarization state to the second polarization state. Control means synchronizes the acousto-optic deflector and polarization switch to cause the deflector to sweep the beam through its scan angle, initiating in the first direction when the beam has the said first polarization state and through its scan angle again, initiating in the said second direction, when the beam has the second polarization state. The system is depicted for use as a laser character generator. An associated method for enhancing the angular resolution of a light beam deflecting system is also disclosed.

3,713,722

ELECTRO-OPTICAL MODULATION APPARATUS USING A SQUARE-WAVE SIGNAL

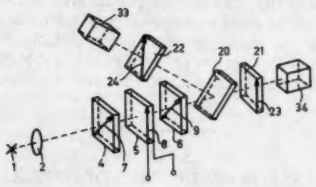
Johannes Antonius Maria Mes, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed April 12, 1971, Ser. No. 133,004

Claims priority, application Netherlands, April 13, 1970, 7005295

Int. Cl. G02f 1/26

U.S. Cl. 350—150 2 Claims



An electro-optical modulation apparatus for modulating the orientation of the plane of polarization of an information carrying light beam uses a square-wave voltage to energize one of three birefringent crystals located in the light beam to a level necessary for rotating the plane of polarization of the energizing beam 90°. The energizing beam is split into subbeams by a polarization sensitive beam splitter and directed to two radiation detectors through corresponding polarizers.

3,713,723

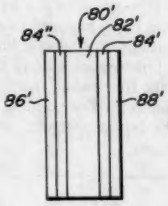
INTEGRATED ELECTRO-OPTIC ANALYZER

William R. Buchan, Lincoln, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed April 21, 1971, Ser. No. 135,979

Int. Cl. G02f 1/26

U.S. Cl. 350—150 5 Claims



An integrated electro-optic birefringent analyzer is disclosed including an electro-optic birefringent medium whose birefringence varies as a function of an associated electric field and a first polarizing medium integrally structured with the electro-optic birefringent medium for detecting the polarization modulation imposed on radiation by the electro-optic birefringent medium.

3,713,724

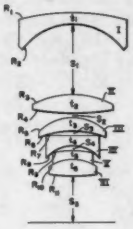
INVERTED TELEPHOTO LENSES HAVING ELEMENTS IN EDGE CONTACT

Robert J. Morante, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,847

Int. Cl. G02b 9/60

U.S. Cl. 350—216 6 Claims



An inverse telephoto lens has a negative singlet widely spaced from a positive group of five lens elements, four of which may be at least in edge contact.

3,713,725

CAMERA OBJECTIVE LENS ADJUSTMENT MEMBER

Kyozo Uesugi, Osaka, Japan, assignor to Minolta Camera Kabushika Kaisha, Osaka, Japan

Filed Nov. 16, 1970, Ser. No. 89,956

Claims priority, application Japan, Nov. 24, 1969, 44/111600 (utility model)

Int. Cl. G02b 7/02

U.S. Cl. 350—247 3 Claims

A camera objective lens mount includes a first circular member rotatably mounted on the front of the camera focussing barrel parallel to the camera focal plane and has a first circular eccentric opening with a spherical peripheral face. A second circular member with a spherical peripheral surface mates and rotatably and tiltably engages the first opening and the camera objective lens is eccentrically mounted in and projects through the second member so as to be universally angularly adjustable and universally movable in directions parallel to the camera focal plane.

3,713,726

TRUCK MIRRORS

Hugo Magi, Etobicoke, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada

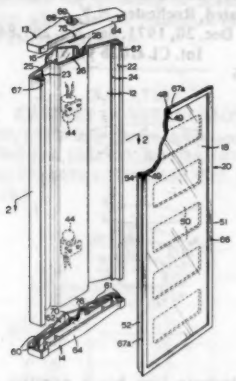
Continuation of Ser. No. 876,735, Nov. 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 698,875, Jan. 18, 1968, abandoned. This application Aug. 23, 1971, Ser. No. 174,168

Int. Cl. G02b 5/08

U.S. Cl. 350—288 6 Claims

A side-mounted truck mirror in which a mirror having a gasket fitted around it is snapped into a suitable backing plate

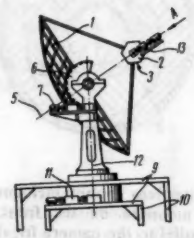
which has engagement members cooperating with the gasket to hold the mirror in place. The backing plate has a rearward recess in which a light source is mounted, and a light-transmitting member covering the recess and hinged to the backing plate in such a way that it can only be inserted and removed through movement axially of the hinge.



3,713,727
SOLAR UNIT

Marlen Manukovich Markosian; Yakov Tigranovich Shermazanian; Grigory Paravonovich Kazanchian; Jury Vardkesovich Avakian, and Albert Vartanovich Vartanian, all of Erevan, U.S.S.R., assignors to Erevanskoe otdelenie Vsesojuznogo nauchno-issledovatelskogo proektno-konstruktorskogo i tekhnologicheskogo instituta kabelnoi promyshlennosti, Erevan, U.S.S.R.

Filed April 22, 1971, Ser. No. 136,521
Int. Cl. G02b *5/08*
U.S. Cl. 350—292 **3 Claims**



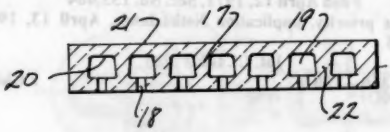
A solar unit comprising a solar energy concentrator with a reflecting surface made of flat facets, and a rotatable solar energy receiver disposed in a solar spot of said concentrator, test objects being mounted on said receiver. The solar energy receiver may be made in the form of a polyhedron or a disk.

3,713,728
PRODUCT AND METHOD FOR MAKING SAME

Lewis M. Austin; Robert R. Denman; Thomas P. O'Donnell, and Frank Veres, all of Toledo, Ohio, assignors to Owens-Illinois, Inc.

Division of Ser. No. 862,122, Aug. 5, 1969, which is a division of Ser. No. 468,691, July 1, 1965, Pat. No. 3,484,328, which is a continuation-in-part of Ser. No. 437,431, March 5, 1965, abandoned. This application July 23, 1970, Ser. No. 63,989
Int. Cl. G02b *7/18*
U.S. Cl. 350—310 **2 Claims**

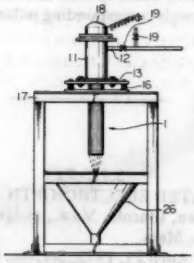
One-piece, light-weight, transparent telescope mirror blanks consisting essentially of one integral shaped mass of transparent, low-expansion, at least partially crystallized glass ceramic having a pair of oppositely disposed face surfaces and a plurality of separate cavities between the face surfaces. One of the face surfaces of the mirror blank has a plurality of openings therein, each of the openings being in communication with a cavity. The cross-sectional area of the opening is smaller than the cross-sectional area of the cavity. Telescope mirrors can be made by coating the surface of the mirror blank with an appropriate reflecting coating. Methods of making the mirror blank and mirror are also disclosed as well as apparatus.



3,713,729
PROCESS FOR PRODUCTION OF OPTICAL FIBER BUNDLES

Touru Inoue, Nishinomiya-shi; Seizo Noguchi, Itami, and Kunihiko Mukai, Tsu, all of Japan, assignors to Nippon Sheet Glass Co., Ltd. and Nippon Glass Fiber Co., Ltd., Mie-ken, Japan

Filed Aug. 3, 1971, Ser. No. 168,560
Int. Cl. G02b
U.S. Cl. 350—320 **5 Claims**



A process for producing a bundle of optical fibers aligned in a highly parallel and compact state, which comprises tying a bundle of a number of optical fibers at a small portion in the vicinity of its one end, holding the tied portion and suspending the non-tied substantial portion of the bundle vertically with said substantial portion being exposed to air, applying a liquid pressure to the tied end portion of said bundle to allow liquid to flow through the interspaces among the individual fibers from the tied end to the free end of the bundle, and imparting a mechanical vibration to the fiber bundle simultaneously with the application of the liquid pressure, and an apparatus for performing said process.

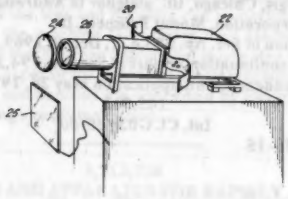
3,713,730
IMAGE RECONSTITUTION SYSTEM

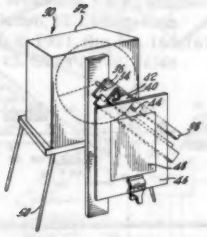
Milton Kaplan, 343 Milltown Road, Springfield, N.J.

Filed Nov. 20, 1970, Ser. No. 91,500
Int. Cl. G02b */00*
U.S. Cl. 350—320 **16 Claims**

A system to reconstitute an image to point-by-point two dimensional correspondence with an object by processing overlapping blurred image discs which result from the aberration and diffraction of point sources and reconstituting these blurred discs into individual image points free of diffraction

and aberration defects so as to provide a true point by point correspondance with the original object. Reconstitution of the blurred discs into individual image points is achieved by a series of one or more nutations, amplifications and denutations, mathematically, photographically, mechanically or electronically (or any combination thereof) of the entire image followed by a final point-by-point retrieval of the image points.





3,713,731

TENSIONING DEVICE FOR EYEGLASS FRAMES

Irving Gardner, P.O. Box 294, Hunter, N.Y.

Filed Aug. 5, 1971, Ser. No. 169,209

Int. Cl. G02c *5/16*

U.S. Cl. 351—113 **4 Claims**

An eyeglass frame has tensioning means for hinged temples. The tensioning means includes a springy member secured to each of the temples. Each member has a cylindrical end edge bearing against an end of the eyeglass frame when the temples are in an open position, thereby exerting pressure thereon. The tensioning members can be adjusted by lateral adjusting screws set with the temples, to a position for the wearer's comfort, whereby a particular pre-set tension will be maintained. The tensioning members may have elongated extensions serving as spring clips.

3,713,732

TWO PIECE GOGGLE CONSTRUCTION

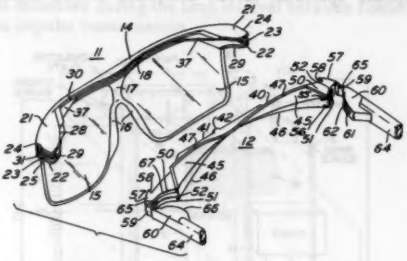
Lester Gooch, Coudersport, Pa., assignor to Midland Optical, Incorporaed, Coudersport, Pa.

Filed June 8, 1971, Ser. No. 150,951

Int. Cl. G02c *5/14, 5/22*

U.S. Cl. 351—153 **7 Claims**

A goggle is disclosed which comprises two molded synthetic plastic interlocking components one of which comprises a front frame with an upper bridge bar and transparent plates or lenses therebelow and with hinge guide elements at the ends, and the other of which comprises temples hinged to a coacting brow bar and with complemental hinge guide components interfitting with the hinge guide elements of the frame component to provide for hinge action, limited lateral movement of the temples and restricted vertical movement at the hinge guide elements throughout the travel range of the temples.



3,713,733

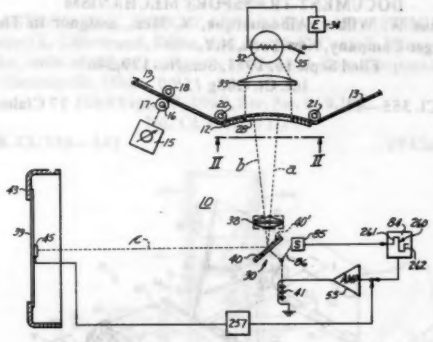
SENSING FIDUCIAL MARKINGS FROM MOTION PICTURE FILM

Robert F. Johnston, Wildwood, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 27, 1971, Ser. No. 175,483

Int. Cl. G03b *41/10*

U.S. Cl. 352—109 **15 Claims**



Fiducial markings having different relative contrasts are sensed from films in continuous film feed motion picture apparatus. Different first electric signals corresponding, respectively, to the different relative contrasts are generated in response to the fiducial markings. Sensing signals indicative of the fiducial markings substantially independently of the different relative contrasts are produced by converting the different first electric signals into corresponding second electric signals having at least one common characteristic. A film motion compensator is controlled with these second electric signals.

3,713,734

APPARATUS FOR FORMING A POSITIVE ELECTROSTATIC IMAGE

Hewitt D. Crane, Portola; Gerald L. Pressman, Cupertino, and George J. Eilers, Redwood City, all of Calif., assignors to Electroprint, Inc., Palo Alto, Calif.

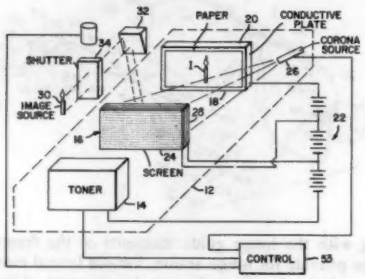
Filed Nov. 11, 1971, Ser. No. 197,877

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 **4 Claims**

A machine for making a copy on a medium such as paper of a visual image. Particles of toner material are accelerated

toward the paper through an apertured screen. Formed on the screen is a pattern of electrostatic charge regions that corresponds to the image so that the arrangement of the toner particles impinging on the paper corresponds to the image. A composite apertured screen composed of two conductive



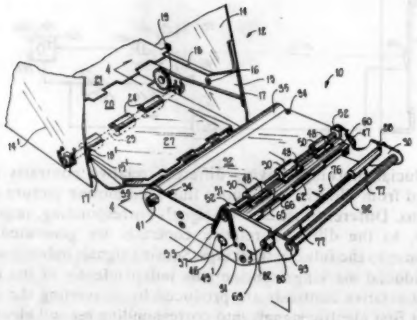
layers separated by an insulative layer and having an insulative layer on one outer surface. Means for establishing oppositely polarized fields across the inner insulative layer and across the outer insulative layer. One of the fields is selectively discharged to control the passage of toner particles through the apertures in the screen.

3,713,735

DOCUMENT TRANSPORT MECHANISM

Thomas W. Wilber, Albuquerque, N. Mex., assignor to The Singer Company, New York, N.Y.

Filed Sept. 10, 1971, Ser. No. 179,346
Int. Cl. G03g *15/00*
U.S. Cl. 355—11 **17 Claims**



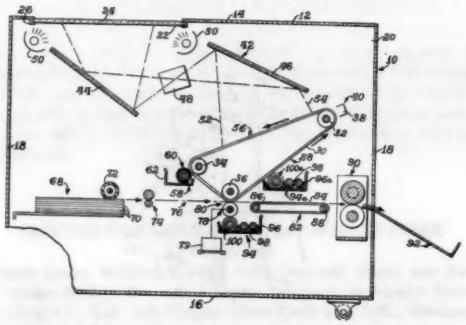
A document handling device comprising a document feed magazine removably supported by a pair of guide tracks in a main frame. The document feed magazine has a rotatable rear roller, a feed roller and associated pressure rollers forward of the rear roller, a diverting member adjustable between a document eject and a document re-enter position forward of the feed roller, and a simple latch for releasably locking the magazine in the guide tracks. Entry feed is provided by the magazine feed roller and pressure rollers mounted in the main frame; exit feed is provided by the feed roller and the associated magazine pressure rollers. Document turnaround is provided by the rear roller in cooperation with a document deflector, which may comprise a movable photoconductive web in an electrostatic copier, located in the main frame adjacent the rear roller.

3,713,736

TONER CLEANING APPARATUS FOR A PHOTOCOPY MACHINE

John R. Sargis, Chicago, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Continuation of Ser. No. 883,477, Dec. 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 794,213, Jan. 27, 1969, abandoned. This application May 20, 1971, Ser. No. 145,513
Int. Cl. G03g *15/00*
U.S. Cl. 355—15 **10 Claims**



Apparatus for removing toner from a transfer roller and/or a recording member of an electrostatic copying machine, comprising a magnetic cleaning roller having the outer surface thereof covered with magnetizable particles and mounted for rotation in a trough partially filled with a supply of magnetizable particles, and in contacting relation with the transfer roller or member. Toner particles adhering to the outer surface of the transfer roller or member are attracted by triboelectric forces to the cleaning roller and are deposited in the trough. In a preferred embodiment, a pair of rotatable, auxiliary rollers are provided within the trough to stir the magnetizable particles and to aid in the deposition of toner particles removed.

3,713,737

READER-PRINTER FOR ELECTROGRAPHS

Hidenori Suzuki, Toyohashi; Isao Iizaka, Toyokawa; Yoshihiro Horie, Toyokawa; Katsumi Maeda, Toyokawa, and Shotaro Inagaki, Okazaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Minamiku, Osaka, Japan

Filed Nov. 12, 1970, Ser. No. 88,762
Claims priority, application Japan, Nov. 15, 1969, 44/108545; Nov. 19, 1969, 44/110024; Nov. 19, 1969, 44/110025
Int. Cl. G03b *27/32*
U.S. Cl. 355—45 **5 Claims**

The machine includes in its lower portion a paper feed assembly, an exposure station, a developing device and a dryer. Disposed above these are a frame for inserting a microfilm, a light source, interchangeable lenses, an optical system for pro-

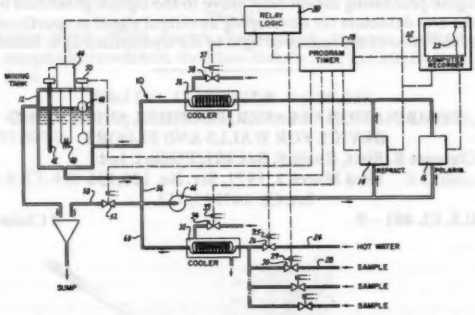
jecting images of the original to a reader section and another optical system for projecting the images of the original on the exposure station. The interchangeable lenses comprise a group of at least five lenses having varying magnifications, and the selection of the lens and focusing can be performed from the outside of the machine. The paper feed assembly when taken out of the machine can be handled in one step for supply of the sensitive paper or for change of a different size of paper. The respective mechanisms are controlled by electric control circuits including a resetting circuit.

3,713,738

METHOD AND APPARATUS FOR RAPIDLY AND SELECTIVELY DETERMINING PURITY OF PROCESS STREAMS

Walter O. Bernhardt, Woodland, Calif., assignor to Beet Sugar Development Foundation, Ft. Collins, Colo.

Filed July 8, 1971, Ser. No. 160,767
Int. Cl. G01n *21/44, 21/46*
U.S. Cl. 356—73 **24 Claims**



System (method and apparatus) for rapidly and selectively determining the "purity" (i.e., ratio of dissolved sucrose to total solids) in multiple process streams. The system employs control mechanisms in conjunction with a generally closed circulatory system to automatically perform all necessary operations for successive purity determinations with respect to a plurality of process streams to be measured, including: preparation of the circulating sample of selected solids concentration, maintenance of the temperature of the circulating sample within a relatively narrow range as respects a predetermined control temperature, automatic polarimetric and refractometric measurement of the concentrations of sucrose and total solids in the circulating sample, and conversion of the polarimetric and refractometric measurements to an indication of the desired sucrose purity ratio. The system specifically operates to provide an automatic purity readout only at such time as the circulating sample is substantially at the predetermined control temperature and desired solids concentration, thus insuring reproducibility of results.

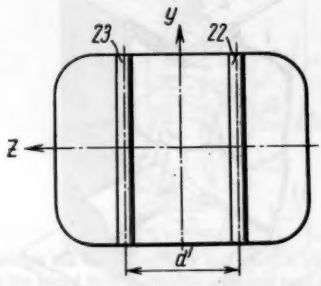
3,713,739

METHOD FOR GAUGING THE LINEAR CROSS-SECTIONAL DIMENSIONS OF MOVING ROLLED PRODUCTS AND AN APPARATUS FOR ITS REALIZATION

Georgy Khristovich Zarezankov; Alexander Semenovich Khokhlov; Valery Ivanovich Cherepnev; Nikolai Sergeevich Druzhinin, and Konstantin Nikolaevich Budtolaev, all of Moscow, U.S.S.R., assignors to Vsesojuzny nauchno-issledovatelsky i proektno-konstruktorsky institut metallurgicheskogo mashinostroenia, Moscow, U.S.S.R.

Filed Feb. 18, 1971, Ser. No. 116,546
Int. Cl. G01b *11/06*
U.S. Cl. 356—163 **2 Claims**

The surfaces of a rolled product the distance between which is being gauged are illuminated with light pulses sent out in the form of a fine line. The light lines reflected from the surfaces are projected onto the screen of a single electron-optical storage element in such a manner that the distance between the line images is proportional to the distance being gauged. The distance between the images of the fine lines on the screen is measured during the time interval between consecutive light-impulse transmissions.



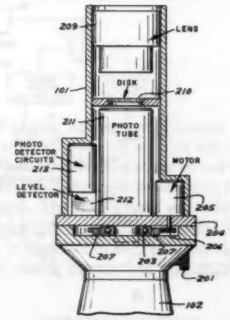
An apparatus for gauging the linear cross-sectional dimensions of a rolled product comprises a slit-diaphragm impulse light source to form a fine light line, and an optical system to present the reflections from the opposite sides of the product in a common plane. This plane contains the screen of an electron-optical storage element. The apparatus comprises an electronic means for measuring the distance between the lines on the screen.

3,713,740

ASTRONOMIC SURVEY APPARATUS AND METHOD

Robert L. Lillestrand, Edina, and Joseph E. Carroll, Minnetonka, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Sept. 20, 1967, Ser. No. 669,192
Int. Cl. G01b *11/26*
U.S. Cl. 356—141 **19 Claims**



A passive star detection device comprising an optical system photodetector means and a transparent slit pattern for receiving the star radiation, and a computer for analyzing the received star radiation and calculating the azimuth and position of the device on the surface of the earth.

3,713,741

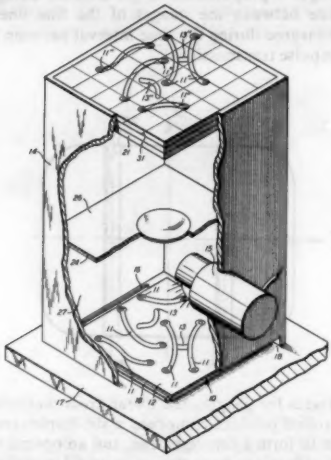
METHODS OF AND APPARATUS FOR LOCATING SOLDER FAULTS

Leo J. Sheehan, III, Reading, Mass., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 3, 1972, Ser. No. 215,002
Int. Cl. G01b *9/08*; G01r *21/30*; G01j *3/34*
U.S. Cl. 356—165 **13 Claims**

Solder faults occurring between the soldered circuit paths of a printed circuit board are visually located by filtering

colored light reflected from the paths and faults with a filter of a configuration identical to the circuit paths. The light reflected from the paths passes through the filter and emerges



a different color than the light reflected from the faults which is either unfiltered or filtered to remove different wave lengths of light. This filtration process results in images of the circuit paths being one color and images of the faults being another.

3,713,742

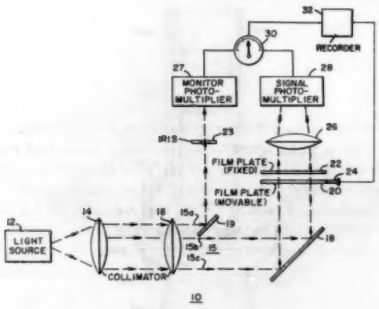
SCENE AUTO-CORRELATOR

Allan C. Goetz; Roger S. Cortesi, both of Washington, D.C., and Lester A. Hauck, Elicott City, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 20, 1970, Ser. No. 82,445

Int. Cl. G01n *21/22*

U.S. Cl. 356—206 **9 Claims**



An apparatus which evaluates the auto-correlation function of two films. A beam of light is directed from a source of light through the two films. The same source of light provides a reference light beam. A volt meter compares the intensity of the light filtering through the two films with the reference beam.

3,713,743

FORWARD SCATTER OPTICAL TURBIDIMETER APPARATUS

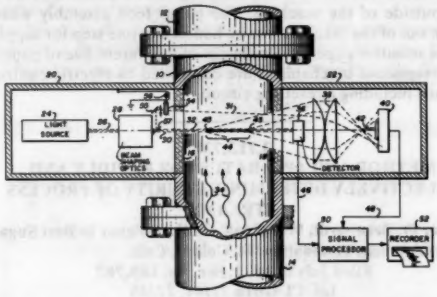
R. John Simms, Menlo Park, Calif., assignor to Agricultural Control Systems, Redwood City, Calif.

Filed Nov. 25, 1970, Ser. No. 92,707

Int. Cl. G01n *21/26*

U.S. Cl. 356—208 **19 Claims**

An optical turbidimeter including a light source for generating a ribbon-shaped light beam for transmission through a fluid process stream, a first light detector for measuring the intensity of the light beam after passage through the process stream, a second light detector responsive to light scattered in the forward direction by the direct beam, spatial filtering op-



tics for focusing the scattered light only from a center section of the direct beam onto the second detector and electronic signal processing means responsive to the signals generated by the two detectors for developing an output signal proportional to the ratio of the scattered light to the transmitted light beam.

3,713,744

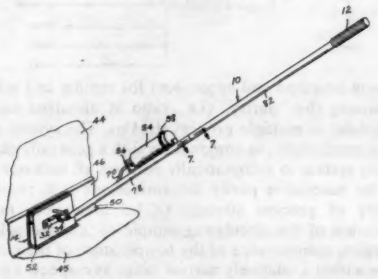
COMBINATION CLEANER, POLISHER AND WAXING DEVICE FOR WALLS AND FLOORS

Clarence R. Sims, Route 6, Box 121, Elkhart, Ind.

Filed March 2, 1971, Ser. No. 120,136

Int. Cl. A47l *13/312*

U.S. Cl. 401—9 **3 Claims**



A combination cleaner, polisher and waxing device for walls and floors which includes an elongated handle having a pad carrier connected to the handle at one end thereof. One side margin of the pad carrier is weighted so as to permit the carrier to assume a generally vertical position for wall cleaning when held spacedly above the floor by the handle. The handle carries a liquid dispenser means which is connected by a conduit to the carrier and which serves to dispense a liquid into the pad of the carrier for use upon the wall or floor. The handle of the device is preferably of a two-piece construction which enables an auxiliary cleaning tool to be attached to the detachable handle piece when separated from the remainder of the handle.

3,713,745

PUSH-TYPE MECHANICAL PENCIL

Yukio Horie, Tokyo, Japan, assignor to Dai Nihon Bungu Kabushiki Kaisha (a/k/a The Japan Stationery Co., Ltd.), Chuo-ku, Tokyo, Japan

Division of Ser. No. 825,837, May 19, 1969, abandoned. This application Jan. 5, 1971, Ser. No. 104,163

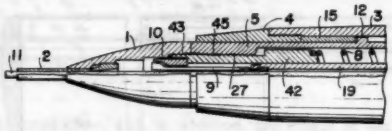
Claims priority, application Japan, July 11, 1968, 43/48681

Int. Cl. B43k *21/22*

U.S. Cl. 401—94 **1 Claim**

A pushing force applied to an end cap of a push-type mechanical pencil compresses initially a first spring to expose

a guide tube at the tip of an inner casing to the outside of a barrel. Then, the stronger pushing force applied successively



to the end cap compresses a second spring to eject a lead through the guide tube by means of a lead ejecting means.

3,713,746

GUIDING APPARATUS FOR CONTROLLING RECTILINEARLY MOVABLE PART OF A MACHINE TOOL

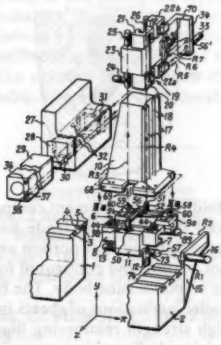
Walter Luthy, 8050 Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Dec. 17, 1970, Ser. No. 99,020

Claims priority, application Switzerland, Dec. 24, 1969, 19196/69

Int. Cl. B23b *23/00*

U.S. Cl. 408—8 **8 Claims**



Guiding apparatus for controlling the movement of a rectilinear movable part in a machine tool. The part is guided by reference to a stationary beam of light. Part is mounted in sliding contact bearings in guideway. Disposition of the part controlled by electro-hydraulic circuit which operates on the bearings in response to changes in position of the part relative to the stationary light beam.

3,713,747

ROCKER ARM STUD DRILLING AND PINNING KIT

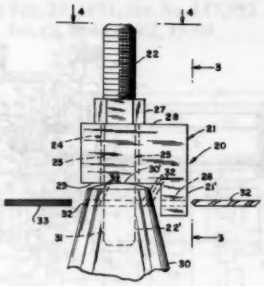
Robert D. Haselmo, 315 North F. Street, Lompoc, Calif.

Filed Feb. 26, 1971, Ser. No. 119,202

Int. Cl. B23b *49/00*

U.S. Cl. 408—115 **2 Claims**

The invention comprises a kit for drilling and pinning press on type rocker arm studs to the mounting bosses of an engine head. The kit has an alignment block which fits over the mounting stud and is held thereon by a nut. The block has a depending block portion with a horizontal bore therethrough which aligns with the mounting boss and stud so that the horizontal bore provides a guideway for a drill bit to drill centrally through the mounting boss and stud. A pin may be inserted in the bored hole to lock the stud and boss together.



3,713,748

GAS TURBINE DUCTED FAN ENGINE

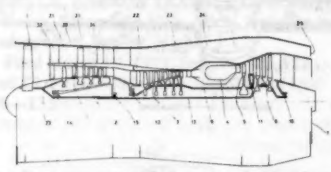
Kenneth Richard Langley, Dursley, England, assignor to Minister of Aviation Supply in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed April 19, 1971, Ser. No. 135,343

Claims priority, application Great Britain, April 28, 1970, 20,247/70

Int. Cl. F01d *1/04*

U.S. Cl. 415—77 **2 Claims**



A gas turbine engine having a multi-stage fan in which the blade rows are spaced apart by at least one and a half chord widths of the adjacent upstream blade to reduce noise. A flow splitter divides the flow through the fan into radially outer and inner flow passages. The first row of stator blades of the fan is reduced in chord width in the inner passage and an additional stage of blading is disposed in the inner passage only, between the first row of stator blades and the second row of rotor blades.

3,713,749

MOTOR-DRIVEN PEDESTAL-MOUNTED PUMP ASSEMBLY AND METHOD FOR MANUFACTURING THE SAME

James B. Fitch, Stratford, Conn., assignor to Nash Engineering Company, Norwalk, Conn.

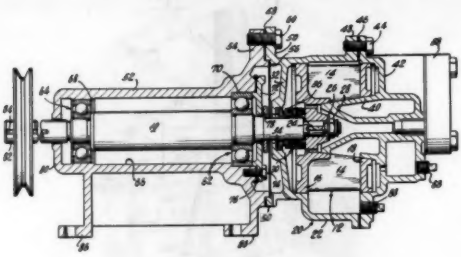
Continuation of Ser. Nos. 823,434, May 9, 1969, and Ser. No. 7,647, Feb. 2, 1970, which is a continuation of Ser. No. 744,437, July 12, 1968, abandoned, and Ser. No. 768,254, Oct. 17, 1968, abandoned. This application Sept. 30, 1970, Ser. No. 76,845

Int. Cl. F04c *19/00*; F04d *29/44*

U.S. Cl. 415—200 **10 Claims**

A motor driven pedestal pump assembly and a method for manufacturing same are disclosed. The assembly has a housing which may include one or two members. The housing supports the bearings and the elongated drive shaft and houses

the pump rotor of the pump assembly. One of the housing members, which may be the sole member, has a bearing bore at one end and a mounting face at the other end. This housing



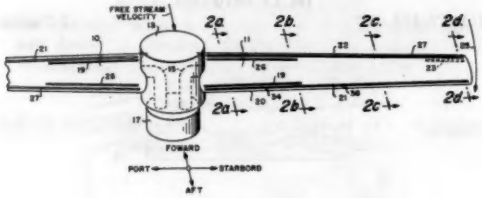
member is hollow and is constructed so that the mounting face and the bearing bore can be machined from one end during a single set up.

3,713,750

CIRCULATION CONTROL ROTOR SYSTEM

Robert M. Williams, Chantilly, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 7, 1970, Ser. No. 95,643
Int. Cl. B64c *27/72*
U.S. Cl. 416—20 **4 Claims**



The rotating blades on a helicopter are in the shape of a cambered elliptical airfoil with blunt edges. A plurality of slots are employed on the upper surface of the air foil to blow a thin sheet of air tangentially across the surface of the foil and around the trailing edge. Circulation control is achieved by the tangential blowing as the sheet of air adheres to the surface and travels around the trailing edge, detaching beneath the trailing edge at a location determined by the intensity of blowing. The effect of the tangential blowing is relocation of the stagnation stream lines producing increased lift on the foil. The air supplied to the slots is modulated with respect to the azimuth position of the rotor and the speed of the rotating blade so that cyclic control over the lift of the rotor can be accomplished without altering the blade attitude.

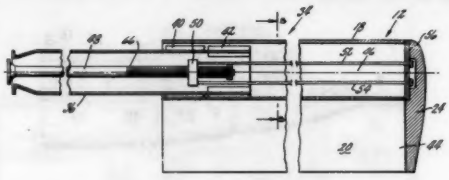
3,713,751

AERODYNAMIC BLADE WITH HIGH STIFFNESS-TO-WEIGHT RATIO

Evan A. Fradenburgh, Fairfield, and Edmond F. Kiely, Stratford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 29, 1970, Ser. No. 85,186
Int. Cl. B64c *11/28*
U.S. Cl. 416—87 **10 Claims**

A flight blade or wing having a structural spar at its forward end comprising a solid forward-portion and an after-portion of low density construction, such as a sandwich construction of honeycomb, plastic foam, or balsa wood core and having a structural trailing edge pocket member to produce a blade of maximum stiffness and minimum weight by eliminating leading edge counterweights and reducing spar weight by sub-



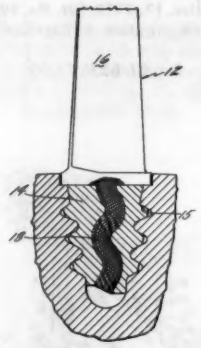
stituting sandwich construction material for solid metal wall members in the spar after portion.

3,713,752

COMPOSITE BLADE FOR A GAS TURBINE ENGINE

Alexander Kurti, West Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 28, 1971, Ser. No. 193,244
Int. Cl. F01d *5/14*
U.S. Cl. 416—219 **6 Claims**



A composite fluid-directing element comprises a laminated, filament reinforced fluid-directing blade having a cambered airfoil portion and a sinusoid root portion and a foot member bonded to the root portion and configured for retention in the undercut slot of a turbomachine body. The blade is formed of a plurality of parallel laminations of sheets including sheets of high modulus, high strength reinforcing filaments embedded in a matrix material and aligned in a spanwise direction. The foot member has a radially extending oscillatory wave form opening conforming to the shape of the blade root portion in which the root portion is received in bonded relation.

3,713,753

FIBER REINFORCED PLASTIC LAMINATE CONSTRUCTION OF AN AIRFOIL WING TYPE MEMBER

Klaus Brunsch, Weidach, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschraenkter Haftung, Muenchen, Germany

Filed Aug. 5, 1969, Ser. No. 847,668
Claims priority, application Germany, Aug. 10, 1969, P 17 79 433.1
Int. Cl. B64c *11/26*
U.S. Cl. 416—226 **4 Claims**

A laminate construction for an airfoil wing type member, such as a helicopter rotor blade, is produced by machine winding multiple layers of reinforcing fiber about a foil-like material support layer on a rotatable mandrel. The laminate construction is cut from the mandrel and shaped to the desired configuration in a mold cavity with the addition of a hardenable resin filler material. In adjacent layers the fibers are wound

to form a diamond shaped pattern. The pitch angles of the fibers in different layers can be varied to accommodate different conditions, and, in addition, the length of the wound layers along the mandrel can be varied as required.

3,713,754

VACUUM PUMPS

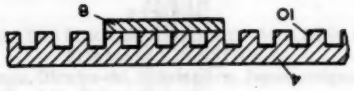
Laurence Laurenson, Horsham, and Leslie Arthur Holland, Crawley, both of England, assignors to The British Oxygen Company Limited, London, England

Filed Nov. 13, 1970, Ser. No. 89,427

Claims priority, application Great Britain, Nov. 14, 1969, 55,998/69

Int. Cl. F04b *37/02*

U.S. Cl. 417—49 **4 Claims**



In a vacuum pump of the getter-ion type, particularly one using Penning discharges, the problem of "argon instability" is at least partially solved by making at least one of the cathodic surfaces of two different materials. One of the materials may be titanium or like reactive metal, while the other material should also be refractory and of considerably higher atomic mass.

3,713,755

PUMPING DEVICE

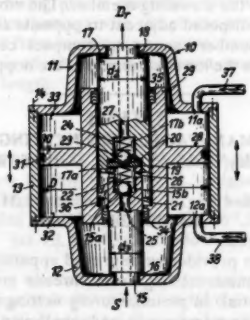
Harry Scheffer, 4812 Brackwede, Germany, assignor to Harry Kruger GmbH, Westfalen, Germany

Filed April 16, 1971, Ser. No. 134,606

Claims priority, application Germany, April 25, 1970, P 20 20 317.2

Int. Cl. F04b *3/00, 5/00, 35/02*

U.S. Cl. 417—258 **7 Claims**



A pumping device having a piston pump and a drive constituted by a thrust-piston motor means actuated by a fluid motive medium, wherein at least one pump is arranged within the motor means.

3,713,756

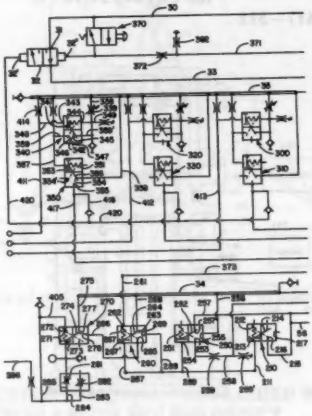
CONTROL FOR GAS COMPRESSION APPARATUS

Karol Pilarczyk, Loudonville, and Hans Pennink, Scotia, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 23, 1971, Ser. No. 117,992

Int. Cl. F04b *49/02, 49/08*

U.S. Cl. 417—295 **3 Claims**



A control for discontinuing normal operation of gas compression apparatus in which a plurality of interconnected devices operate to place the apparatus in an idle state upon the occurrence of an undesirable condition in the apparatus.

3,713,757

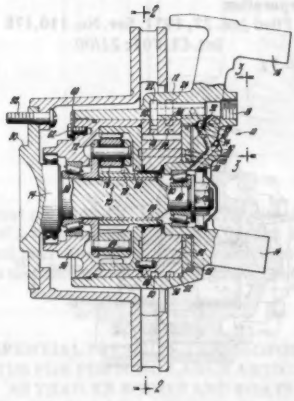
HYDRAULIC ENERGY TRANSLATING DEVICE

Gilbert K. Hause, Bloomfield Hills, Mich., assignor to General Motor Corporation, Detroit, Mich.

Filed March 18, 1971, Ser. No. 125,522

Int. Cl. F01c *19/08;* **F03c** *3/00;* **F04c** *15/00*

U.S. Cl. 418—133 **4 Claims**



A hydraulic energy translating device of the peripherally expansible working chamber type in which one side plate cooperating with the cam and rotor to form one end of the working chambers is secured in a fixed position by the housing. Another side plate is rotatably mounted in the housing and is movable to close the other end of the working chambers. The movable side plate is urged into closing relationship with the working chambers when fluid pressure is developed in the high pressure circuit and is moved away from the working chambers to permit exhausting thereof when the high pressure circuit is exhausted.

3,713,758

REFRIGERATION COMPRESSOR FOR VEHICLES

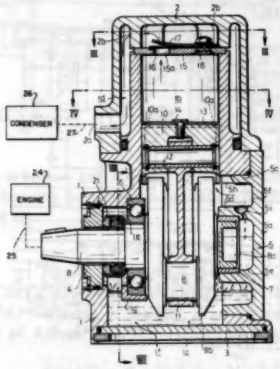
Shozo Nakayama, Kariya, Japan, assignor to Kabushiki-Kaisha Toyoda Jidoshokki Seisakusho, Aichi-ken, Japan

Filed April 28, 1971, Ser. No. 138,185

Claims priority, application Japan, April 29, 1970, 45/36607

Int. Cl. F04b 39/12

U.S. Cl. 417—312 5 Claims



A refrigeration compressor for vehicles provided with a discharging port formed at a cap portion thereof for discharging compressed refrigerant and with a suction port formed in a crank shaft room for leading the refrigerant thereinto. The cap portion is provided with several component passages for discharging refrigerant having different size spaces and different directions so that the cap functions as a muffler.

3,713,759

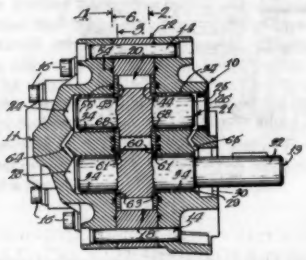
GEAR PUMP WITH SEAL PLATES

Frederic W. Pollman; Lee R. Frandsen, and Charles D. Throckmorton, Sr., all of Rockford, Ill., assignors to Sundstrand Corporation

Filed Jan. 27, 1971, Ser. No. 110,178

Int. Cl. F01c 21/00

U.S. Cl. 418—71 14 Claims



A high pressure rotary gear pump including a housing having a pair of external gear members intermeshing at a location between an inlet and an outlet, a pair of shafts carrying the gear members and having opposite ends mounted in bearings in the housing, a pair of thin generally 8-shaped floating seal plates around the shafts at opposite sides of the gears, means providing a definite primary area on the gear side of each plate subjected to outlet pressure applying a primary force tending to separate the plate from the gears, means defining a pressure balance area subjected to outlet pressure to overcome the primary force, a recess in the periphery of each plate at each end thereof supplying outlet pressure to the primary pressure balance area, means defining secondary areas between the inlet and the primary areas on the gear side of each plate subjected to pressure gradients varying with speed and applying secondary forces tending to separate the plate from the gears, means defining a pressure balance area on the remote side of each plate opposed to each secondary area, an aperture in each plate intermediate the ends of each secondary area communicating the secondary area with the opposed pressure balance area to overcome the secondary force, and a land on the periphery of each plate between the inlet and each peripheral recess beveled to deform in use on contact with the housing when subjected to high pressure, thereby to provide an effective seal between the inlet and each recess.

3,713,760

APPARATUS FOR INSITU ENCASEMENT OF TUBULAR MEMBERS WITHIN CEMENTITIOUS MATERIAL

Charles Wayne Hemphill, Route No. 2, Box 30 A, Ben Wheeler, Tex.

Filed Jan. 12, 1971, Ser. No. 105,906

Int. Cl. E03f 3/06

U.S. Cl. 425—59 8 Claims

Apparatus for encasing tubular members in cement with the cement encased tubular members being disposed within a ditch dug in advance of the encasing operation. The apparatus includes a removable hopper means which is supported by a troweling member and is placed above a fixed vertical bulkhead with the bulkhead having pipe alignment means and seal means associated therewith. A removable vibrator extends through part of the hopper and into close proximity of a rearward portion of the bulkhead, and into underlying relationship with respect to the troweling member. The vibration producing member is disposed adjacent to opposite sides of each of the tubular members so as to compact cement as it is discharged from the lower extremity of the hopper.

3,713,761

MANUFACTURE OF NETTING

Anthony Bramley, Gosford House, Gosford, Kidlington, England

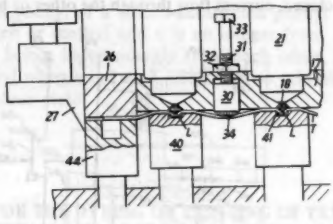
Filed Aug. 5, 1970, Ser. No. 61,315

Int. Cl. B28b 19/00

U.S. Cl. 425—109 9 Claims

The invention provides an improved apparatus for producing recilinear mesh netting from threads containing thermoplastic material. In manufacturing netting in accordance with the invention transverse threads are drawn across parallel longitudinal threads and discrete masses of thermoplastic material in heated condition are moulded in respective dies about the thread crossings. The path of each transverse thread between the dies is extended by an amount corresponding to the contraction of the transverse thread which occurs in the

moulding operation. The apparatus is preferably fitted with adjustable thread diverter elements between each die so that the extent to which the transverse thread deviates can be varied to correspond with the shrinkage incurred in each particular case, depending on the nature of the threads employed

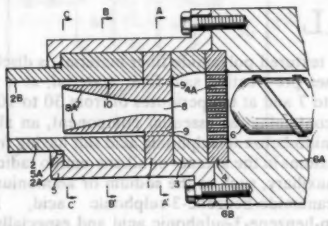


and on the number of longitudinal threads or the mesh size. Netting produced in accordance with the invention can be used for a variety of purposes for example in sports or for fishing and when electrically conductive threads are employed the netting can be used for electrified agricultural fencing.

3,713,762
APPARATUS FOR THE EXTRUSION MOLDING OF FOAMABLE PLASTICS

Shozo Oisugu, Ohmiya-shi, Saitama-ken, Japan, assignor to C. I. Kasei Co., Ltd., Tokyo, Japan

Filed June 18, 1971, Ser. No. 154,413
Claims priority, application Japan, June 26, 1970, 45/63073
Int. Cl. B29h 7/20
U.S. Cl. 425—197 **10 Claims**



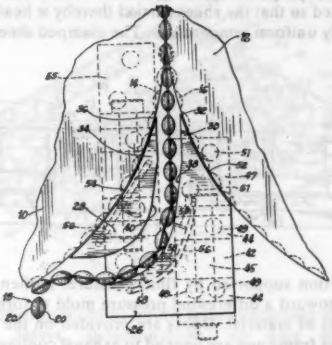
Apparatus for the extrusion molding of foamable plastics which produces a smooth and sturdy surface on the extruded product by covering plastic material which has foamed in a central expansion passage with the plastic material which has been restrained from foaming in an outer, narrow surrounding passage which is of substantially constant cross-sectional area throughout its length.

3,713,763
BRIQUET BREAKER MEANS

Le Roy S. Harris, Rolling Meadows, Ill., assignor to K-G Industries, Inc., Rosemont, Ill.

Filed Jan. 18, 1971, Ser. No. 107,333
Int. Cl. B29f 3/00; B30b 11/00
U.S. Cl. 425—308 **13 Claims**

A briquetting construction of the type employing opposed rolls or other means for forming a length of compacted material. Means are provided for breaking the length of material into separate pieces comprising a shoe having a surface portion located in the path of movement of the length of material. Engagement of the length of material with the surface portion operates to deflect the length of material out of the path of movement with longitudinal stress being developed whereby cracks are formed in the length of material. The material is driven into engagement with a separate surface, preferably the

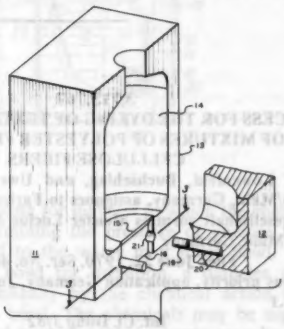


moving surface of one of the briquetting rolls, to achieve fracture.

3,713,764
APPARATUS FOR REMOVING THE FLASHED WASTE FROM A BLOW MOLDED OBJECT

Melvin O. Nelson, Kansas City, Mo., assignor to Phillips Petroleum Company

Filed Sept. 28, 1970, Ser. No. 76,025
Int. Cl. B29c 17/07, 17/08
U.S. Cl. 425—302 **4 Claims**



An undercut portion on an extended opposite side of opposing halves of a blow mold engages and imparts a twist to the waste flashed plaque of a blow molded article to remove this plaque from the molded article as the mold is opened.

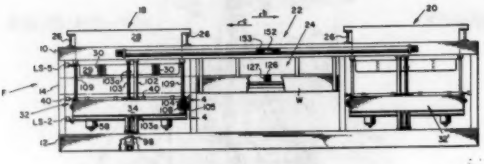
3,713,765
DIFFERENTIAL PRESSURE THERMOFORMING APPARATUS FOR FORMING LARGE ARTICLES SUCH AS TRAILER BODIES AND BOATS

Donald J. Rise, Box 321, Mount Pleasant, Mich.

Filed Oct. 22, 1970, Ser. No. 83,099
Int. Cl. B29c 17/00
U.S. Cl. 425—384 **22 Claims**

Differential pressure thermoforming apparatus for forming large articles such as trailer bodies and boats in relatively thin sheets of thermoplastic material comprising a sheet supporting box frame for clamping the edge portions of a sheet of thermoplastic material and defining a cavity spanned by the clamped sheet. Load assist bars are disposed in the cavity to initially support the mid-portion of the thermoplastic sheet while it is being clamped on the frame and then fluid under

pressure is admitted to the cavity to lift the midportion of the sheet upwardly off the bars. A sheet heating oven is mounted laterally adjacent one side of the mold box frame and is movable into superposed relation with the box frame where it is then tilted so that the sheet carried thereby is heated to a substantially uniform temperature. The clamped sheet, having its



mid-portion supported by fluid pressure, is then moved upwardly toward a differential pressure mold to form a shape in the sheet of material. Doors are provided on the sides of the mold box frame and are opened to exhaust cooling air which is introduced to the cavity. After the shape is formed and the mold box frame is moved away from the mold, the load assist bars function to eject the molded part from the frame.

3,713,766

OIL BURNER CONTROL SYSTEM

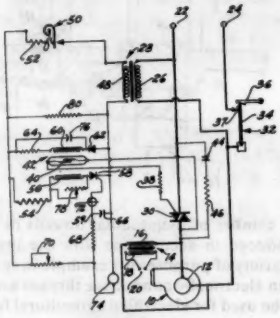
Donald E. Donnelly, Edwardsville, and Robert C. Krump, Waterloo, both of Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sept. 7, 1971, Ser. No. 178,099

Int. Cl. F23n *5/20*

U.S. Cl. 431—69 **10 Claims**

An automatic control system in which electrically operated fuel and air supply and ignition means are energized at supply line voltage through a circuit controlled by a thermal time switch and a solid state switch; the system further including gating means for the solid state switch under control of a small sensitive electromagnetic relay having two windings parallel connected in a low voltage thermostat circuit. Closure of the small relay to effect conduction of the solid state switch requires energization of one or both of its windings but requires only the energization of the other of the windings to hold it closed, current flow through the other or hold-in winding being rectified and capacitance filtered with sufficient capacitance to retain hold-in energization through momentary interruptions of the thermostat circuit; the system further including an electrical resistance heater series connected with the one relay winding and operative when energized for a short predetermined period of time to heat and open the thermal time switch, and flame responsive switching means operative to instantly de-energize the resistance heater and the one series connected relay winding when flame appears at the burner.



CHEMICAL

3,713,767

PROCESS FOR THE DYEING OF TEXTILE MATERIAL OF MIXTURES OF POLYESTER FIBERS AND CELLULOSE FIBERS

Rudolf Lowenfeld, Buchschlag, and Uwe Kosubek, Offenbach/Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed June 22, 1970, Ser. No. 48,429

Claims priority, application Germany, June 24, 1969, P 19 31 881.1

Int. Cl. D06p *3/82*

U.S. Cl. 8—21 C **7 Claims**

Process for the dyeing of textile materials consisting of mixtures of polyester fibers with cellulose fibers, wherein the said textile materials are treated with an alkaline solution which contains a coupling component, a disperse dyestuff and wetting or dispersing agents, dried and subsequently treated with an acid solution, which contains, in addition to compounds having an acid reaction, a diazotized aromatic or heterocyclic amine, dried and then subjected to a heat treatment.

3,713,768

LONG CHAIN ALKANE OR ALKENE AMIDO BENZENE SULFONATE ASSISTED DYEING OF SYNTHETIC LINEAR POLYAMIDES

Hans Wegmuller, and Karlheinz Keller, both of Riehen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 12, 1970, Ser. No. 88,986

Int. Cl. D06p *5/04*

U.S. Cl. 8—172 **6 Claims**

A process for the even, non-streaky dyeing of fiber material made from synthetic polyamide of differing dyestuff-affinity, such as textured polyamide fiber material, is disclosed, which comprises pre-treating said fiber material, at a pH-value of from 2 to 7 and at temperatures of from 30 to 100° C, with a liquor containing, as essential component, an alkane- or alkene-amido-benzene-sulphonic acid salt having from 10 to 19 carbon atoms in the alkane- or alkene-amido radical, as anion-active auxiliary, such as the sodium or ammonium salts of 1-octadecanamido-benzene-3-sulphonic acid, 1-octadec-9-enamido-benzene-3-sulphonic acid and especially 1-octadec-9-enamido-benzene-3-ammonium sulphonate, thereafter adding the solution of at least one anionic dyestuff at temperatures of from 40 to 100° C and completing the dyeing at temperatures of from 95 to 140° C. By this process, even on synthetic polyamide fiber material tending to exhibit streakiness upon dyeing and with poorly levelling dyestuffs, even and non-streaky dyeings are obtained with a single anion-active auxiliary, said auxiliary being moreover suitable for the levelling of streaky and uneven dyeings by means of an after-treatment.

3,713,769

PROCESS FOR THE DYEING OF AROMATIC POLYAMIDE FIBRES

Walter Beal, Cheadle Hulme, Cyril Hobday, East Didsbury, James Jack, Bramhall, and John Francis Edmund Keenan, Cheadle Hulme, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Dec. 22, 1970, Ser. No. 100,843

Claims priority, application Great Britain, Dec. 23, 1969, 62,554/69

Int. Cl. D06p *5/04*

U.S. Cl. 8—173 **12 Claims**

Process for the dyeing of aromatic polyamide fibres, particularly aromatic polyamide fibres having a highly

crystalline physical structure wherein said fibres are dyed with an aqueous dye liquor containing a cationic or disperse dye and at least one compound having the formula

$$R-O-(CH_2-\underset{Z}{CH}-O)_n-H$$

wherein R is phenyl or a chloro-substituted phenyl group, Z is hydrogen or methyl and *n* is an integer from 1 to 3, and each Z being, independently from each other, hydrogen or methyl when *n* is 2 or 3, obtaining on said fibres an excellent colour yield.

3,713,770

PROCESS FOR THE DYEING OR PRINTING OF TEXTILE MATERIALS MADE FROM POLYMERS OR COPOLYMERS OF ACRYLONITRILE

Eberhard Mundlos, Heusenstamm; Reinhard Mohr, and Konrad Lohe, both of Offenbach/Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

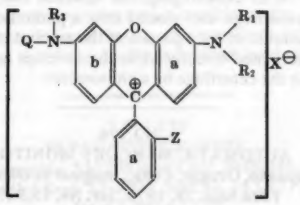
Filed Jan. 20, 1971, Ser. No. 108,220

Claims priority, application Germany, Jan. 23, 1970, P 20 02 916.7

Int. Cl. D06p *3/70*

U.S. Cl. 8—177 AB **7 Claims**

Process for the dyeing and printing of textile materials made from polymers or copolymers of acrylonitrile by using dyestuffs of the general formula



wherein R_1, R_2, and R_3 each stands for a hydrogen atom or an optionally substituted lower alkyl group, Z represents a carboxylic ester group, Q stands for an aromatic or heterocyclic radical bound or not bound to the benzene nucleus *b*, $X^{\ominus}$ represents an anion, and wherein each benzene nucleus *a* or *b* or the radical Q may optionally be substituted by non-ionic substituents, and which dyeings and prints show very clear and brilliant shades and have good fastness properties.

3,713,771

METHOD FOR ORGANIZED ASSAY AND BENDABLE TEST TUBE RACK THEREFOR

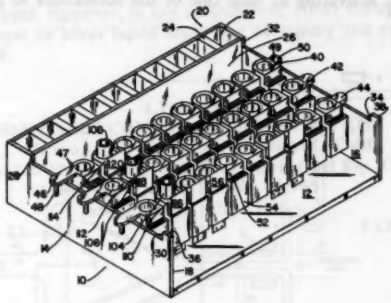
Billy W. Taylor, 2965 Mi Elama Circle, Walnut Creek, and Hubert N. Divelbiss, 2594 West Pueblo, Napa, Calif.

Filed May 13, 1971, Ser. No. 142,950

Int. Cl. A47b *73/00*; B01l *9/00*; G01n *33/16*

U.S. Cl. 23—230 R **9 Claims**

Apparatus and method for systematic organization of samples. Flexible gangs of sample holders are used permitting organization in either a linear or a curved arrangement and transfer from one to the other arrangement without changing the juxtaposition and organization of individual samples. Identity strips are associated with each sample holder to provide for both computerized and non-computerized identification of the sample, recording information concerning intended treatments, assays, determinations, or data obtained therefrom.



3,713,772

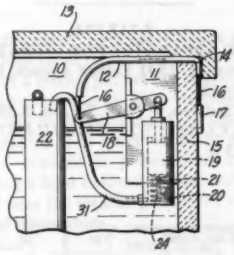
METHOD OF TESTING FOR DIABETES

Jon H. Tavel, 17643 Belinda St., Encino, Calif. 91316

Filed July 2, 1971, Ser. No. 159,128

Int. Cl. G01n *31/22, 33/16*

U.S. Cl. 23—230 B **7 Claims**



A method of testing for diabetes in which the chemicals required for determining the presence of glucose in the urine are supplied to the water in a toilet bowl. Upon use of the toilet bowl for urination, a diabetes test is performed automatically by the chemical action which takes place in the bowl. The chemicals may be supplied each time the bowl is used or their supply may be selectively controlled by the user. An example is given in which the chemicals required for an enzyme test are supplied in liquid form.

3,713,773

METHOD OF DETERMINING TRACE AMOUNTS OF GASES

Arthur Fontijn, Princeton, N.J., and Pieter H. Vree, Croton-on-Hudson, N.Y., assignors to Aerochem Research Laboratories, Inc.

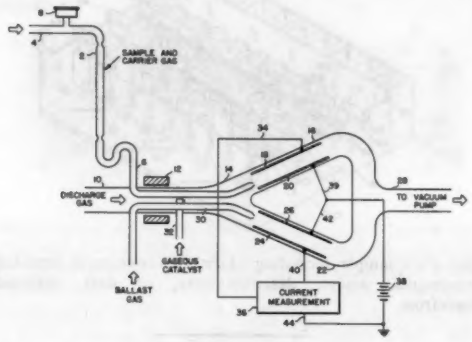
Continuation-in-part of application Ser. No. 663,369, Aug. 25, 1967. This application Nov. 9, 1970, Ser. No. 87,747

Int. Cl. G01n *27/70*

U.S. Cl. 23—232 R **19 Claims**

Method of detecting trace amounts of volatile substances such as carbon oxides, nitrogen oxides, sulfur oxides and oxygen, comprising taking a measured sample of the gaseous mixture containing the gas to be detected, separating the gas being detected from the mixture where necessary, forming a first component which includes the

gas being detected and, preferably, a carrier gas, providing a second component which contains a substance to be reacted with the first component to produce chemi-ions, activating at least one of the substances to produce



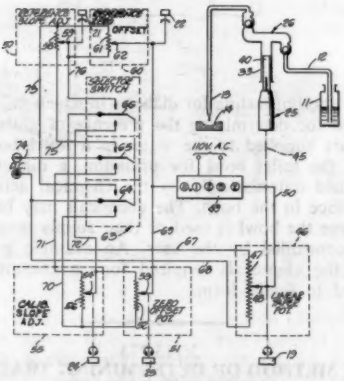
the species necessary to form chemi-ions, mixing the components to form the chemi-ions, passing the mixture between electrodes and measuring an electrical current produced by the chemi-ions formed.

3,713,774

METHOD AND APPARATUS FOR TITRATING LIQUIDS

Samuel G. Southwick, 1501 Leland Avenue, Springfield, Sangamon County, Ill.

Filed Feb. 4, 1970, Ser. No. 8,585
Int. Cl. B67d *5/26*; **G01n** *1/14, 31/16*
U.S. Cl. 23—253 R **6 Claims**



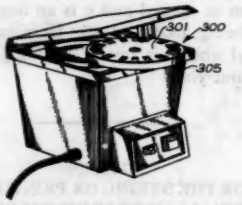
Apparatus for dosing from a titrant reservoir and transferring or metering discrete quantities of the titrant to an unknown sample. An electric analog signal is generated in response to liquid transference representative of the amount of liquid transferred. Calibration circuits weight the analog signal to reflect titrant concentration and sample volume and thereby provide direct readout on a display means, such as a digital voltmeter for example, of a titrated sample concentration. The calibration circuits also furnish analog subtraction of the analog signal to establish direct readout of the concentration of a back-titrated sample.

3,713,775

CENTRIFUGE CLINICAL CHEMISTRY ANALYSIS SYSTEM

William David Schmitz, Indianapolis, Ind., assignor to Bio-Dynamics, Inc., Indianapolis, Ind.

Filed June 22, 1970, Ser. No. 48,386
Int. Cl. B04b *9/10*; **G01n** *21/24, 33/16*
U.S. Cl. 23—253 R **15 Claims**



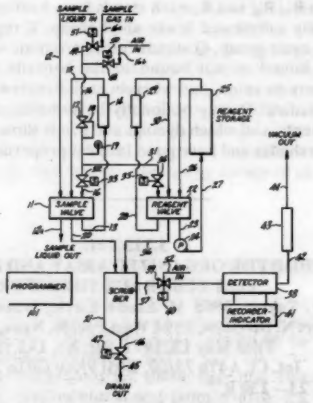
Medical testing apparatus including a centrifuge with a series of cuvettes received therein. The cuvettes may be discrete units or arranged in groups which make up cassettes. Each of the cuvettes has a test chamber or reaction chamber into which reagents and specimen pass during the centrifuging operation. The reagents are contained prior to centrifuging in plastic bags which include intentionally weak seams designed to fail during centrifuging and to permit the reagents to flow into the reaction chamber. The specimen is contained within a pipette tip closed by a cap. The cap is also designed to fail or, in other words, be centrifuged off of the pipette tip in order to permit the blood serum or plasma in the pipette tip to flow past the cap and into the reaction chamber after the red blood cells have been packed down into the cap by the centrifuging operation. After centrifuging, the cuvettes can be removed from the centrifuge and placed into a photometer to determine the amount of light passed or the amount of light passed can be determined directly while the cuvettes are being spun or turned in the centrifuge by a photometer.

3,713,776

AUTOMATIC MERCURY MONITOR

Italo A. Capuano, Orange, Conn., assignor to Olin Corporation

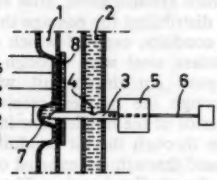
Filed Sept. 28, 1970, Ser. No. 75,927
Int. Cl. G01n *31/00*
U.S. Cl. 23—253 R **3 Claims**



Apparatus and method for analyzing fluid streams for their content of elemental and ionic mercury even in the presence of other contaminants, for example, elemental or available

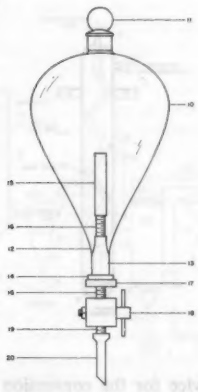
chlorine. The sample is automatically measured and treated with aqueous stannous chloride reagent. The resulting elemental mercury is transferred to a photometric detector and the results are indicated and/or recorded automatically, accurately and rapidly. The apparatus and method are especially useful in the control of mercury contamination in the environment and also for monitoring chemical process streams.

3,713,777
LIQUID ANALYZING DEVICE
Michel Joseph Auphan, Courbevoie, and Jean Robert Perilhou, Bourg-la-Reine, France, assignors to U.S. Philips Corporation, New York, N.Y.
Filed June 16, 1971, Ser. No. 153,573
Claims priority, application France, July 1, 1970, 7024422
Int. Cl. G01n *1/14*
U.S. Cl. 23—259 **2 Claims**



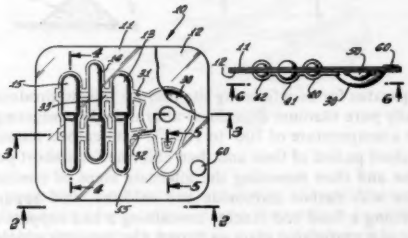
Device for liquid analysis, the liquid samples being contained in working tubes, which may communicate with auxiliary tubes containing auxiliary liquids by means of a hollow needle having a lateral orifice, which pierces through an auxiliary tube into a working tube. The lateral orifice is then located inside the auxiliary tube and the orifice at the tip of the needle is located inside the working tube.

3,713,778
SEPARATORY FUNNEL
Narbik A. Karamian, 5117 Wilson Lane, Bethesda, Md.
Filed Sept. 23, 1971, Ser. No. 183,177
Int. Cl. B01d *17/02*
U.S. Cl. 23—259 **11 Claims**



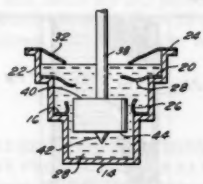
Separatory funnel devices wherein either an upper liquid layer or a lower liquid layer can be selectively removed. These may be removed using the same or different conduits or stopcock valves. The devices consist essentially of an adjustable conduit which extends up into the flask portion of the separatory funnel for removing at least the upper liquid layer. For removing the lower liquid layer there may be a separate conduit and valve, or the same conduit extending up into the flask may be used. However, in any embodiment, either the upper liquid layer or lower liquid layer may be rapidly and easily removed.

3,713,779
DISPOSABLE COMPARISON DETECTOR KIT
James J. Sirago, 910 Enterprise, Inglewood, Calif., and Edward B. Walton, 3129 Yale Ave., Marina Del Rey, Calif.
Filed Dec. 7, 1970, Ser. No. 95,765
Int. Cl. G01n *21/20, 33/16*
U.S. Cl. 23—259 **9 Claims**



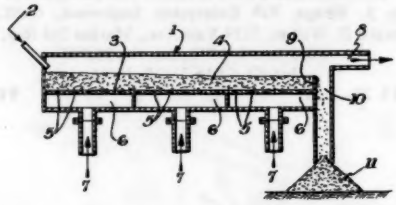
A sealed flexible plastic package contains ampuls of chemicals which are broken to release the contents and pass them through canals to a mixing pocket which contains a substance to be tested. The chemicals create a mixture having a certain characteristic color in the presence of an ingredient for which the test is conducted. For more accurate detection a small quantity of the mixture is passed into a smaller pocket preferably having a light colored bottom surface, and a color patch is placed near the smaller pocket for visual comparison with the color of the mixture.

3,713,780
APPARATUS FOR CHEMICAL TESTING
Stephen Shapiro, East Bridgewater, Mass., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Feb. 1, 1971, Ser. No. 111,360
Int. Cl. G01n *1/16*; B65d *79/00*
U.S. Cl. 23—259 **4 Claims**



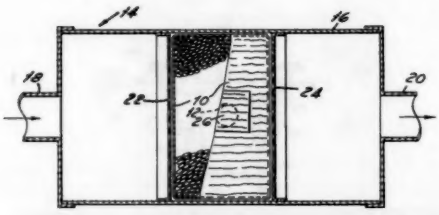
A reagent container having a series of tiered compartments containing prepackaged reagents for the chemical evaluation of a test sample. A frangible diaphragm seals each compartment from the succeeding compartment. A sample is introduced into the top compartment. After incubation a breaker punctures the seal of the adjacent compartment, allowing the reagents to mix and react. The procedure is repeated for each reagent filled compartment.

3,713,781
CROSS-FLOW FLUID BED REACTOR
Wendell E. Dunn, Jr., 12 Trelawney Street, Sydney, N.S.W., Australia
Filed Oct. 21, 1970, Ser. No. 82,337
Int. Cl. B01j 1/00; C01g 23/04; C22b 1/10
U.S. Cl. 23—284 10 Claims



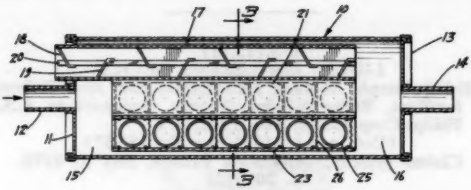
Apparatus for beneficiating titaniferous ores to produce essentially pure titanium dioxide by alternatingly contacting the ore at a temperature of 700° to 1250°C with carbon monoxide for a short period of time and then chlorine for a short period of time and then repeating the alternate steps of contacting the ore with carbon monoxide and chlorine, said apparatus comprising a fluid bed reactor containing a bed support consisting of a perforated plate or fritted disc beneath which is a compartamentalized gas plenium chamber, each compartment of the chamber being served by a gas feed line whereby sequential and alternating zones of carbon monoxide and chlorine are encountered by the ore proceeding through the fluidized bed, an overhead outlet tube by which gases are exhausted from the reactor, and a side outlet port by which the solid product is removed.

3,713,782
METHOD FOR INSERTION OF PARTICULATE CATALYTIC MATERIAL IN A CATALYTIC CONVERTER HOUSING
David A. Watt, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed April 15, 1971, Ser. No. 134,250
Int. Cl. B65b 1/24; F01n 3/14; B01j 9/04
U.S. Cl. 23—288 F 1 Claim



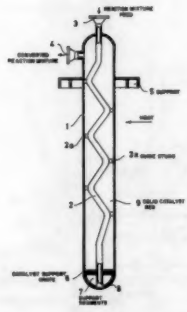
A method for placing a predetermined quantity of particulate catalytic material within the housing of a catalytic converter is described. A gas-permeable and preferably heat-decomposable material is used to form a container having a fill opening. The container is filled with particulate catalytic material, after which the filled container is inserted in the catalytic converter housing.

3,713,783
CATALYTIC MUFFLER
Frank J. Greipel, 49 E. Larpenteur Ave., St. Paul, Minn. 55117
Filed Aug. 9, 1971, Ser. No. 170,220
Int. Cl. B01j 9/04; F01n 1/14, 3/16
U.S. Cl. 23—288 F 8 Claims



A pollution reducing muffler for internal combustion engines in which exhaust gases, after entry into the muffler housing, are distributed for passage through a plurality of longitudinal conduits, each of which contains a series of coils of stainless steel wire through which the exhaust gases must pass. An air conduit, which extends longitudinally through the muffler, receives atmospheric air from the exterior of the muffler housing. This air is heated in its passage through the air conduit and is mixed with the gases passed through the exhaust conduits prior to discharge from the muffler housing. The air conduit is preferably provided with interior baffles to define a serpentine flow path through the conduit to prolong the residence of the air within the conduit to facilitate heating of the air.

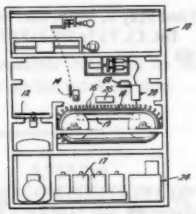
3,713,784
REACTION ELEMENT FOR THE CONVERSION OF HYDROCARBONS
Gunther Hess, Offenbach-Bieber, Gerhard Martens, Offenbach am Main, and Kurt Pohl, Braunfels, Germany, assignors to Vickers-Zimmer Aktiengesellschaft Planung und Bau von Industrieanlagen
Filed Jan. 14, 1970, Ser. No. 2,872
Claims priority, application Germany, Jan. 15, 1969, P 19 01 758.4
Int. Cl. B01j 9/00; B01d 1/00; C10g 1/02
U.S. Cl. 23—288 R 6 Claims



A reaction device for the conversion of hydrocarbons which includes an outer housing and an inner sinuous conduit. The housing is closed at one end and has two openings at the other end. The conduit is attached, near one end, to the housing at one of said openings and it terminates near said closed end and communicates with

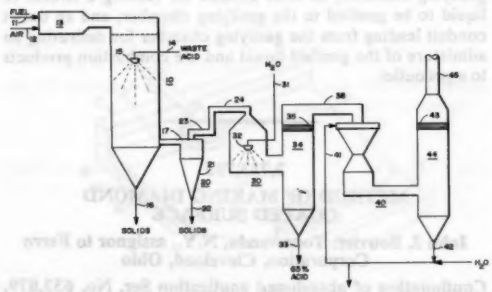
the interior of said housing at that point. Preferably, the device is provided with a thermal expansion compensator located between the housing and the conduit at their points of attachment, and the conduit is provided with a protective jacket.

3,713,785
FUME EXHAUST AND TREATING SYSTEM
John J. Moran, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.
Filed Jan. 20, 1971, Ser. No. 108,022
Int. Cl. F23j *11/00, 11/08;* B01l *1/00*
U.S. Cl. 23—292 **6 Claims**



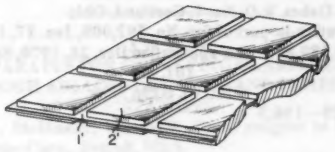
A fume exhaust and treating system having a hood for receiving fumes to be treated and including a circulating water system with a venturi therein and connected to the hood for creating a vacuum for drawing fumes from the hood and a container in the circulating water system with means for injecting water and a treating agent into the container for treating the fumes and an overflow drain connected to the water system. A fume treating system in combination with a chemical testing apparatus which automatically performs chemical tests for removing the noxious fumes from the apparatus.

3,713,786
EVAPORATIVE SULFURIC ACID RECOVERY FROM SULFURIC ACIDS CONTAINING SULFATES
Charles H. Umstead, Palmerton, Pa., assignor to The New Jersey Zinc Company, Bethlehem, Pa.
Filed Dec. 6, 1971, Ser. No. 205,252
Int. Cl. B01d *1/18;* C01b *17/90*
U.S. Cl. 23—307 **22 Claims**



Sulfuric acid in concentrated form is recovered from dilute, waste sulfuric acid liquors containing metal sulfates, such as those resulting from the leaching of mineral values from ores and the like or from the cleaning of metals such as iron and steel. Separation of the sulfate salts in substantially dry form is effected by total evaporation of the water and of the sulfuric acid; condensation of these vapors is controlled so that the resulting acid is of increased concentration.

3,713,787
POROUS PLATE MADE OF METAL FIBERS
Yoshihiro Kuniyasu, Kawasaki; Akio Matsumoto; Eiji Isobe, both of Tokyo, and Hironobu Honda, Tokyo, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan
Filed Nov. 23, 1970, Ser. No. 91,827
Claims priority, application Japan, Nov. 28, 1969, 44/95559
Int. Cl. B22f *1/00*
U.S. Cl. 29—182.2 **6 Claims**



A porous plate substantially consisting of metal fibers which are formed in a layer, wherein said fibers which form the external circumferential area and/or a part of the internal area of the aforementioned layer are bonded, and such bonded part has a higher density as compared with the area other than the bonded part.

3,713,788
POWDER METALLURGY SINTERED CORROSION AND HEAT-RESISTANT, AGE HARDENABLE NICKEL-CHROMIUM REFRACTORY CARBIDE ALLOY
Arnold L. Prill, Edmond, Okla., and Stuart E. Tarkan, Monsey, N.Y., assignors to Chromalloy American Corporation, West Nyack, N.Y.
Filed Oct. 21, 1970, Ser. No. 82,785
Int. Cl. C22c *29/00;* B22f *3/12*
U.S. Cl. 29—182.7 **8 Claims**

An age hardenable, corrosion and heat resistant nickel-chromium, refractory carbide alloy is provided by powder metallurgy for use at elevated temperatures as high as 2000°F (1090°C) comprising primary grains of at least one refractory carbide selected from the group consisting of TiC, CbC, VC and TaC dispersed through a matrix of an age hardenable, corrosion and heat resistant nickel-chromium alloy consisting essentially by weight of about 5 to 30 percent chromium, up to about 15 percent iron, about 0.5 to 5 percent titanium, about 0.2 to 5 percent aluminum, up to about 25 percent cobalt, up to about 0.25 percent carbon and the balance essentially nickel.

3,713,789
CEMENTED CARBIDE COMPOSITIONS AND PROCESS FOR PRODUCING THE SAME
Lars Henry Ramovist, Nynashamn, Sweden, assignor to Rederiaktiebolaget Nordstjernam, Nynashamn, Sweden
Filed Dec. 4, 1970, Ser. No. 95,104
Claims priority, application Sweden, April 2, 1970, 4530/70
Int. Cl. B22f *1/00*
U.S. Cl. 29—182.8 **7 Claims**

Cemented tungsten carbide compositions exhibiting high bending strength (transverse rupture strength) combined with high hardness are provided by using specially prepared tungsten carbide produced from tungsten powder formed by the hydrogen reduction of tungsten chloride.

3,713,790

JOINED BODY OF PYROLYTIC GRAPHITE AND METALLIC MEMBERS

Takeshi Takamori, and Masanobu Akanuma, both of Tokyo-to, Japan, assignors to Nippon Electric Company, Limited, Tokyo-to, Japan

Filed Aug. 12, 1969, Ser. No. 849,463
Claims priority, application Japan, Aug. 14, 1968, 43/57883
Int. Cl. B32b *15/04*
U.S. Cl. 29—195 1 Claim

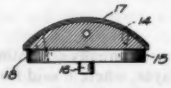
A method for joining pyrolytic graphite to metallic members by using a brazing composition comprising at least 90 percent by weight of a copper-chromium, gold-chromium, or silver-chromium mixture.

3,713,791

SLIPPER BEARING

Grant A. Oakes, R.D. No. 4, Cortland, Ohio

Continuation-in-part of Ser. No. 792,008, Jan. 17, 1969, Pat. No. 3,589,875. This application Dec. 28, 1970, Ser. No. 101,977
Int. Cl. B23p *3/00*
U.S. Cl. 29—196.3 4 Claims



A slipper bearing such as used in a coupling in a drive line of a blooming mill comprises a replaceable bearing forming part of the coupling. The slipper bearing disclosed is of conventional size and shape and is a composite structure having a cast ferrous metal core and softer bronze alloy wearing surfaces. The soft shell construction uses the harder ferrous metal core usually cast steel for its ability to resist breakage and for maintaining the shape and insuring the positioning of the slipper bearing in the coupling of the drive line of the blooming mill while the softer bronze alloy metal forming the wearing surfaces contributes to an unusually long trouble free life.

3,713,792

STABILIZATION OF FUEL ADDITIVES

David R. Wiley, Warminster, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

No Drawing. Filed Dec. 23, 1970, Ser. No. 101,152
Int. Cl. C10l *1/32, 9/00*
U.S. Cl. 44—4 18 Claims

The present disclosure is directed to a method of stabilizing fuel additives. The method generally entails incorporating in the fuel additive an effective amount of glycerol ester having at least a

group, where R_1 represents a hydroxy substituted aliphatic group having from about 11 to about 24 carbon atoms.

3,713,793

FUEL GAS COMPOSITION

Takeji Maruyama, Nishinomiyashi, and Tadao Uenae, Osakashi, both of Japan, assignors to Iwatani & Co., Ltd., Osaka, Japan

Filed Jan. 13, 1969, Ser. No. 790,847
Claims priority, application Japan, June 3, 1968, 43/38115; May 4, 1968, 43/29962
Int. Cl. C10l *1/00*
U.S. Cl. 44—52 5 Claims

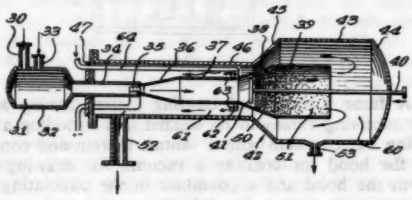
A fuel gas composition which comprises essentially a mixture gas of 65–90 volume percent of acetylene and 35–10 volume percent of LP gas, the mixture of gas being dispersed in a high pressure container which is packed with a porous material permeated with a solvent or solvents selected from a group consisting of acetone, toluene and xylene. The composition is found to be safely storable, transportable and usable under high pressure, has relatively constant composition upon withdrawal from storage, and effective in welding or torch cutting.

3,713,794

DIRECT CONTACT LIQUID GASIFIER AND METHOD

James Bernard Maher, Hinsdale; Terry Wayne Delahunty, Plainfield, and Edmond Louis Patton, Clarendon Hills, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed May 8, 1970, Ser. No. 35,694
Int. Cl. F17c *9/02*; F17d *1/04*
U.S. Cl. 48—190 7 Claims



A method of gasifying a liquid by feeding the hot products of combustion of a combustible material into intimate direct contact with a stream of the liquid at a rate to provide sufficient heat content to gasify the liquid stream and form a stream of the liquid in gaseous or vapor form diluted by the said products of combustion. The method is useful in gasifying substances which are liquid at ambient temperatures and pressures and liquefied gases. The liquid can be combustible or noncombustible. The method is specifically useful for gasifying liquefied natural gas by burning natural gas to form the hot combustion products.

Apparatus for gasifying a liquid comprising a burner for burning a combustible material with air, oxygen or oxygen-enriched air to form hot combustion products, a gasifying chamber for gasifying a liquid, an inlet conduit for directly feeding the hot combustion products from the burner to the gasifying chamber, an inlet conduit for feeding a stream of liquid to be gasified to the gasifying chamber, and an outlet conduit leading from the gasifying chamber for delivering an admixture of the gasified liquid and the combustion products to a gas outlet.

3,713,795

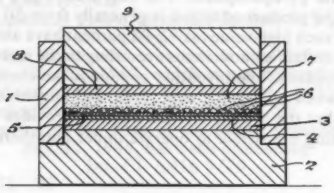
METHOD OF MAKING DIAMOND COATED SURFACE

John J. Bouvier, Tonawanda, N.Y., assignor to Ferro Corporation, Cleveland, Ohio

Continuation of abandoned application Ser. No. 633,879, Apr. 26, 1967, which is a continuation of application Ser. No. 842,783, June 27, 1969. This application June 4, 1971, Ser. No. 150,186
Int. Cl. B24b *1/00*; C08g *51/12*
U.S. Cl. 51—295 6 Claims

The tips of abrasive diamonds are pressed into a soft

substance while a bonding material behind the diamonds is compressed and cured to hold them to a backing. The



soft substance is thereafter removed to leave sharp exposed abrasive points on the working side.

3,713,796

LENS POLISHING COMPOSITION CONTAINING DIAMONDS IN AN EPOXIDE RESIN MATRIX

Paul F. Valerio, and Robert M. Werner, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1969, Ser. No. 788,655
Int. Cl. C08g *51/12*
U.S. Cl. 51—298 **10 Claims**

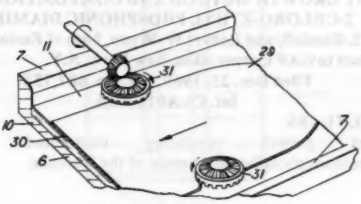
The use of tiny diamonds for finish polishing of glass lenses has been made possible by incorporating them into a lap material comprising very small diamonds in a special polymeric matrix of the reaction product of an organic epoxide with an appropriate "hardener," such as a polyamine.

3,713,797

MANUFACTURE OF FLAT GLASS

Jack Lawrenson, St. Helens, England, assignor to Pilkington Brothers Limited, Liverpool, England

Filed Oct. 27, 1970, Ser. No. 84,347
Claims priority, application Great Britain, Nov. 3, 1969, 53,711/69
Int. Cl. C03b *17/00, 18/00*
U.S. Cl. 65—91 **8 Claims**



Thin float glass, down to about 1.5 mm. thick, is produced by applying lateral stretching forces to a layer of molten glass advancing in ribbon form along a molten metal bath, by means of rotary members engaging the ribbon margins and each oriented so that a part of its periphery engages a margin of the ribbon and impels the glass outwardly to assist the flow of the glass to a desired thickness.

3,713,798

METHOD OF PRESS SHAPING GLASS SHEETS

George W. Stilley, Freeport; William E. Wagner, Verona, and Joseph D. Kelly, Cheswick, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 37,424, May 13, 1970, abandoned, which is a continuation of Ser. No. 672,738, Oct. 4, 1967, abandoned. This application Jan. 6, 1971, Ser. No. 104,496
Int. Cl. C03b *23/02*
U.S. Cl. 65—106 **6 Claims**

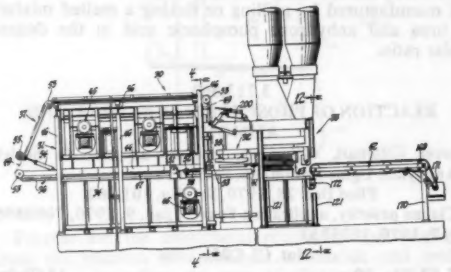
A method of bending glass sheets and an improved mold containing a specially treated cover of fiber glass fabric that contacts the hot glass during bending.

3,713,799

APPARATUS FOR CONVEYING GLASS SHEETS THROUGH ADJACENT BENDING AND TEMPERING STATIONS

Harold A. McMaster, Woodville, Ohio, assignor to Guardian Industries Corp., Detroit, Mich.

Division of Ser. No. 691,326, Dec. 18, 1967, Pat. No. 3,607,200. This application April 12, 1971, Ser. No. 133,092
Int. Cl. C03b *23/02*
U.S. Cl. 65—273 **17 Claims**



An apparatus for curving a sheet of glass including a furnace having an elongated gas support bed for supporting sheets of glass thereover, conveying means for moving a sheet from the first end to the second end of the bed, a bending station disposed adjacent the second end of the bed and including a sheet supporting surface for supporting a sheet of glass on gases thereover, a shuttle means for moving a sheet of glass from the second end of the bed to the gas supporting surface in the bending station, a blasthead adjacent the bending station for impinging fluid against opposite sides of the sheet for cooling thereof, oscillating means in the blasthead for oscillating a sheet therein, and unitary frame means for lifting a sheet from the gas supporting surface in the bending station for bending the sheet and for thereafter moving the sheet into the blasthead while at the same time removing a sheet from the oscillating means in the blasthead to remove the sheet from the blasthead. The independently novel features of the conveying assembly are the shuttle means and its specific structure for moving a sheet of glass from the furnace to the bending station, the single unitary frame means for supporting a sheet in the bending station and moving it into the blasthead while simultaneously removing a sheet from the blasthead, the unique support of the forming surface means in the bending station against which a sheet is pressed for curving thereof, and an oscillating means in the blasthead for removing a sheet from the frame means and oscillating the sheet in the blasthead while it is being cooled.

3,713,800

PROCESS FOR PRODUCING GARBAGE BASED FERTILIZER

John N. Karnemaat, 1304 W. Maple St., Kalamazoo, Mich.

Continuation of Ser. No. 775,116, Nov. 12, 1968, abandoned. This application May 24, 1971, Ser. No. 146,521

Int. Cl. C05f 9/00; C05c 9/00

U.S. Cl. 71—14 6 Claims

A fertilizer is made by adding dry fertilizer chemicals, including urea, to dry composted organic waste materials, following which a mixture of prepolymer of urea and formaldehyde suspended in an excess of formaldehyde is added and then phosphoric acid or other mineral acid is added in order to produce the fertilizer product.

3,713,801

NITROGEN-PHOSPHATE FERTILIZERS AND THEIR MANUFACTURE

Dahlia S. Greidinger, Haifa, and Liuba Cohen, Kiriat Motzkin, Israel, assignors to Chemicals & Phosphates Ltd., Haifa, Israel

No Drawing. Filed July 27, 1970, Ser. No. 58,665

Claims priority, application Israel, Aug. 15, 1969, 32,831/69

Int. Cl. C05b 15/00

U.S. Cl. 71—29 4 Claims

The presence of biuret in nitrogen-phosphate fertilizers which has hitherto been practically unavoidable, is undesirable since biuret is phytotoxic even at low concentrations. The invention provides prilled or flaked nitrogen-phosphate fertilizers virtually free of biuret, in which the ratio $N:P_2O_5$ is not substantially larger than 3:1, which are manufactured by prilling or flaking a melted mixture of urea and anhydrous phosphoric acid in the desired molar ratio.

3,713,802

REACTION OF PHOSPHORIC ACID, UREA, AND AMMONIA

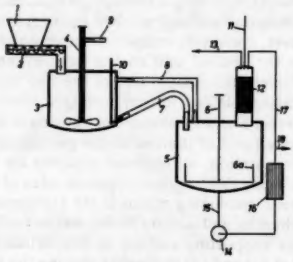
Marcel Gittenait, Colombes, France, assignor to Societe Anonyme: Ugine Kuhlmann, Paris, France

Filed Dec. 28, 1970, Ser. No. 101,962

Claims priority, application France, Jan. 9, 1970, 7000806; July 7, 1970, 7025133

Int. Cl. C05b 7/00

U.S. Cl. 71—29 14 Claims



A process for obtaining, in the same manufacturing process, two different fertilizers, namely a solid or liquid fertilizer which is based on ammonium and urea polyphosphate and the solutions of which are clear and stable over a period of time, and a solid binary fertilizer (N,P) or solid ternary fertilizer (N, P, K) which is very concentrated and based on ammonium-urea phosphate.

The process of the invention makes use of the action of ammoniation and condensation of urea phosphate, because owing to its mode of formation this compound gives rise to a separation of the impurities of wet process orthophosphoric acid, e.g., iron, aluminum, calcium, magnesia and fluorine, which remain in the mother liquors from centrifugation of the urea phosphate crystals.

According to a preferred embodiment of the invention a reaction product is obtained which is constituted mainly of ammonium pyrophosphate. The non-ortho P_2O_5/ total P_2O_5 ratio of the product obtained is generally from 50 to 70 percent, but such high values as 92–98 percent have also been obtained in certain embodiments according to the invention.

The process of the invention combines the chemical reactions between phosphoric acid, urea, and ammonia in such a manner that the overall thermal balance provides an excess, thus making it possible to operate under autothermal conditions.

3,713,803

PRODUCTION OF PHOSPHATE FERTILIZERS

Rudolf Holst, Hannover-Waldheim, and Ulrich Hauschild, Hannover, both of Germany, assignors to Kali-Chemie AG, Hannover, Germany

Continuation of Ser. No. 721,920, April 17, 1960, abandoned, Continuation-in-part of Ser. No. 632,407, April 20, 1967, abandoned. This application April 13, 1971, Ser. No. 145,077

Int. Cl. C05b 13/00

U.S. Cl. 71—45 8 Claims

A phosphate fertilizer is prepared from a mixture of phosphate rock, silica, and an alkali metal hydroxide solution. The alkali metal hydroxide solution is concentrated and at least partially carbonated by carbon dioxide containing gases, before it is incorporated in the mixture. The granulated mixture is then calcined in a rotary kiln, and the hot waste gases of the kiln are used for the preceding concentrating and carbonating step.

3,713,804

PROCESS FOR REGULATING PLANT GROWTH

David E. Moccia, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 1, 1970, Ser. No. 33,895

Int. Cl. A01n 9/24

U.S. Cl. 71—78 10 Claims

Compositions comprising diethyleneglycol monobutyl ether, an ethyleneglycol hydrocarbyl ether or its ester, and a surfactant selected from the group consisting of anionic surfactants, cationic surfactants, and nonionic primary, secondary and tertiary amines in a weight ratio relationship of, respectively, about 2:1:1; the compositions are particularly useful, in diluted form, for systemically (as well as by contact) retarding or inhibiting the growth of meristematic plant tissue, particularly tobacco suckers.

3,713,805

PLANT GROWTH METHOD AND COMPOSITION USING 2-CHLORO-ETHYL PHOSPHONIC DIAMIDE

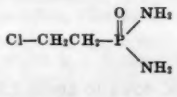
David I. Randall, and Robert W. Wynn, both of Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 23, 1969, Ser. No. 887,752

Int. Cl. A01n 9/36

U.S. Cl. 71—86 6 Claims

Plant growth regulating compound is 2-chloroethanephosphonic diamide of the formula:



where the compound is prepared by the reaction of ammonia with 2-chloroethylphosphonyl dihalide and subsequently purified to remove ammonium halide by reaction with a secondary amine in chloroform.

3,713,806

WEED KILLING COMPOSITIONS USING 2,4-BIS (ISOPROPYLAMINO) - 6 - METHOXY-TRIAZINE, 2,4-BIS(ISOPROPYLAMINO) - 6 - METHYLTHIO-s-TRIAZINE, PENTACHLOROPHENOL AND A 2,4-D COMPOUND

Michael Anthony Priola, Briarcliff Manor, N.Y., assignor to Ciba-Geigy Corporation

No Drawing. Continuation-in-part of application Ser. No. 692,693, Dec. 22, 1967, which is a continuation-in-part of application Ser. No. 492,931, Oct. 4, 1965. This application May 11, 1970, Ser. No. 36,384
The portion of the term of the patent subsequent to Jan. 12, 1988, has been disclaimed
Int. Cl. A01n 9/20
U.S. Cl. 71—93 5 Claims

Compositions containing 2,4-bis(isopropylamino)-6-methoxy-s-triazine, 2,4-bis(isopropylamino) - 6-methylthio-s-triazine, 2,4-D, pentachlorophenol and herbicidal oil are long-term weed killers. A single application of these compositions effectively controls weeds through an entire growing season.

3,713,807

HERBICIDAL METHOD FOR COMBATING SHATTERCANE

Richard A. Schwartzbeck, Olathe, Kans., assignor to Gulf Research Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 853,475, Aug. 27, 1969. This application June 11, 1970, Ser. No. 45,575
Int. Cl. A01n 9/22
U.S. Cl. 71—93 1 Claim

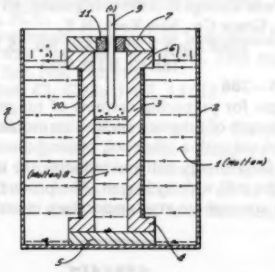
A two-component herbicide combination consisting essentially of 2-chloro-4-cyclopropylamino-6-isopropylamino-s-triazine and alachlor gives better control of certain weeds than either of these herbicides alone. Pre-emergence use of the combination on corn gives a wide spectrum of weed control without injury to the corn.

3,713,808

METHOD OF PREPARING EQUIPMENT FOR HOLDING MOLTEN METAL

Hans Joachim Wallbaum, and Wolfgang Hornschemeyer, both of Osnabruck, Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft

Filed Sept. 4, 1970, Ser. No. 69,824
Claims priority, application Germany, Sept. 15, 1969, P 19 46 598.6
Int. Cl. C22d 7/00; C23b 5/56
U.S. Cl. 75—10 R 8 Claims



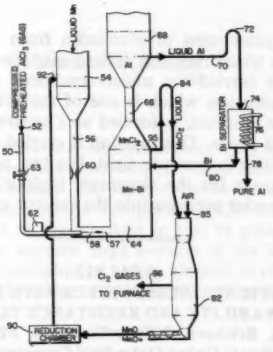
Method of preparing equipment for holding molten high melting, chemically active metal such as titanium, molybdenum or the like in a crucible or mold, including the prevention of formation of impurities and non-metal inclusion in the molten metal, by providing a receptacle of refractory material as cast, extruded or welded part exhibiting microscopic pores, but providing only insignificant leakage at room temperature; at least a portion of the outer wall surface of the receptacle is lined with a protective layer of copper, chromium, nickel or tin for sealing the pores and for covering at least part of the wall surface of the receptacle with that lining to establish a dense integral pore-free layer that is integral with the sealing of the pores, the lining may also provide corrosion proofing if the receptacle is immersed in a corroding fluid (e.g., potossium or sodium or the like). The receptacle is then filled with the metal and sealingly closed at least when the metal is in the liquid state.

3,713,809

PROCESS FOR PRODUCING ALUMINUM

Charles Toth, Westwego, Raymond V. Bailey, Metairie, and Harry G. Harris, Jr., New Orleans, La., assignors to Applied Aluminum Research Corporation, Westwego, La.

Filed Sept. 15, 1969, Ser. No. 858,011
Int. Cl. C22b 21/02; C01g 45/06
U.S. Cl. 75—68 B 8 Claims



Process for the continuous production of aluminum from the reaction of aluminum trichloride and molten manganese including the step of alloying a solute flux in the molten manganese which prevents aluminum as it is formed in the process from alloying with manganese. The solute flux comprises a substance which is unreactive with the reaction mixture, highly miscible with manganese yet essentially immiscible with aluminum at the temperature of the reaction. Suitable solute fluxes include bismuth, lead, antimony, cadmium, tin, thallium, zirconium, vanadium, nickel, chromium, sulfur, silver, halogen, salts of the foregoing metals, alkali halides and alkaline earth halides.

3,713,810

BENEFICIATION OF BERYLLIUM

Kenneth A. Walsh, Fremont, Ohio, and Andrew J. Sandor, Perrysburg, Ohio, assignors to The Brush Beryllium Company, Cleveland, Ohio

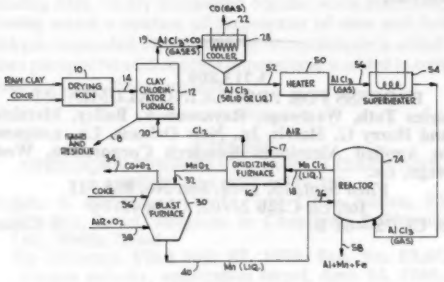
Filed May 11, 1970, Ser. No. 36,448
Int. Cl. C22b 35/00
U.S. Cl. 75—101 R 8 Claims

There is provided an improved process for beneficiating beryllium metal and more particularly a process for purifying beryllium particles, particularly cast or virgin beryllium particles, by leaching with aqueous acid at relatively low temperatures for up to 6 or 8 hours, and characterized by the step of submitting the beryllium, either before or after conversion to particulate metal, to a thermal aging treatment at elevated temperatures for a prolonged period of time.

3,713,811
PROCESS FOR PRODUCING ALUMINUM

Charles Toth, Westwego, and Harry Gordon Harris, Jr., Metairie, La., assignors to Applied Aluminum Research Corporation, Westwego, La.

Filed Apr. 29, 1971, Ser. No. 138,663
Int. Cl. C22b *21/02*; C01g *45/06*
U.S. Cl. 75—68 R 5 Claims



In the production of aluminum from the reaction of aluminum trichloride and molten manganese wherein the reaction is carried out under conditions such that manganese dichloride, which is one of the principal by-products of the reaction, is formed as a separate substantially pure liquid phase. This reaction is carried out in a special reactor which is pressure tight, has two pour spouts, and heating means for the aluminum trichloride which is introduced under pressure into the reactor at the bottom.

3,713,812
FERRITIC STAINLESS STEELS WITH IMPROVED DRAWABILITY AND RESISTANCE TO RIDGING

Kenneth G. Brickner, O'Hara Township, Allegheny County, Pa., assignor to United States Steel Corporation

Filed Aug. 3, 1970, Ser. No. 60,678
Int. Cl. C22c *39/14*
U.S. Cl. 75—126 B 16 Claims

A method for increasing the deep drawability, as represented by *r* value, of ferritic stainless steels. A complex equation shows the interrelation of the various alloying elements. Within the compositional range similar to that of type 430 steel, the *r* value may be increased by employing C and Cr at the lower end of the range and employing Si at the higher end of the range. Increasing the amount of Mn will increase *r* value for a type 430 steel, but will have just the opposite effect if Cb is present to any appreciable degree.

3,713,813
METHOD AND COMPOSITION FOR INCORPORATING ADDITIVES INTO MOLTEN METAL

Charles E. Lundin, Evergreen, Colo., assignor to Colorado Springs National Bank as trustee, Colorado Springs, Colo.

No Drawing. Filed Oct. 8, 1970, Ser. No. 79,305
Int. Cl. C22c *9/08*
U.S. Cl. 75—135 7 Claims

A method of, and composition for, incorporating additives into molten metals, wherein the additive is bound or contained in a first metal or alloy which is added to said molten metal. For example, a homogeneity promoter of graphite and a metal carbonate can be mixed with scrap filings of lead-bearing alloys as a binder and the mixture compacted under pressure to form a coherent pellet which can be added to a molten alloy, such as a brass or a bronze. As the metal binder melts the homogeneity promoter will be released.

3,713,814
COPPER-ZINC ALLOY

Karl Olof Larsson, Zug, Switzerland, assignor to Olof Manner AB, Molndal, Sweden

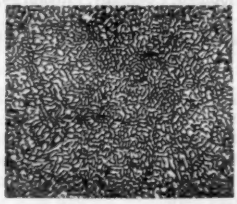
No Drawing. Filed Mar. 12, 1971, Ser. No. 123,905
Int. Cl. C22c *9/02, 9/08*
U.S. Cl. 75—156.5 2 Claims

Many different copper-zinc alloys were necessary when making pipe fitting members because of the various properties required. The present copper-zinc alloy has a broad spectrum of properties and with this one alloy all the component parts for pipe fitting can be manufactured. The alloy consists of 62–65% Cu; 1–3% Pb; 0.2–0.8% Ni; 0.2–0.8% Mn; 0.1–0.6% Al; 0.3–1.0% Si; 0.2–1.0% Sn; 0.02–0.2% Sb; and the remainder is zinc.

3,713,815
CAST COBALT-BASE EUTECTIC TYPE ALLOY

Donald H. Boone, North Haven, Conn., Donald A. Koss, Houghton, Mich., and David E. Peacock, Guilford, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 9, 1971, Ser. No. 132,836
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 3 Claims



A cobalt-base alloy containing chromium, carbon, aluminum and scandium or yttrium is unidirectionally solidified to provide an oxidation resistant structure with high strength imparted by a strong skeletal-type or aligned lamellar carbide phase, solidification proceeding in accordance with the monovariant eutectic reaction.

3,713,816
PROCESS FOR PREPARING TUNGSTEN-SILICA CERMETS

Adolfo P. MacCragh, Ellicott City; Arvind S. Patil, Silver Spring, and George E. Ashby, Highland, all of Md., assignors to W. R. Grace Co., New York, N.Y.

Filed April 2, 1970, Ser. No. 25,293
Int. Cl. B22f *1/00*
U.S. Cl. 75—206 3 Claims

A process for preparing cermets of tungsten and silica by mixing a source of tungsten such as ammonium metatungstate or tungsten sol with a silica sol, passing the resulting mixture through a fluid energy mill and reducing the tungsten in the effluent of the mill with hydrogen. The product is then sintered in an inert atmosphere at a temperature in excess of 1,500°C.

3,713,817
METHOD OF PRODUCING POWDER METAL ARTICLES

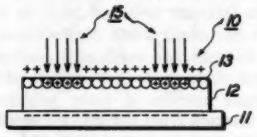
Orville W. Reen, Lower Burrell, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Apr. 25, 1969, Ser. No. 819,414
Int. Cl. B22f *1/00*
U.S. Cl. 75—211 2 Claims

Described herein is a method of producing articles of predetermined carbon content from powdered iron and

iron alloys which involves blending with the powdered iron, powdered cast iron which has been heat treated to at least partially spheroidized iron carbide in the cast iron.

3,713,818
MIGRATION IMAGING SYSTEM WITH MOLTEN LIQUID DEVELOPMENT
William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed July 13, 1970, Ser. No. 54,263
Int. Cl. G03g 13/22
U.S. Cl. 96—1 R 13 Claims



Migration material in contact with an insulating layer is caused to imagewise selectively migrate to at least locations in depth in the insulating layer by subjecting the migration material to an imagewise migration force and then contacting the insulating layer with a molten liquid.

3,713,819
XEROGRAPHIC IMAGING AND DEVELOPMENT USING METAL OXIDE CARRIER PARTICLES
Robert J. Hagenbach, and Myron J. Lenhard, both of Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Division of Ser. No. 631,192, April 17, 1967, Pat. No. 3,591,503. This application Nov. 30, 1970, Ser. No. 93,847
Int. Cl. G03g 9/00, 13/08
U.S. Cl. 96—1 SD 4 Claims

A xerographic carrier bead material for use in developing electrostatic latent images comprising a glass composition of from about 10 to about 40 parts oxides of silicon, from about 5 to about 50 parts oxides of barium, and oxides of metals selected from the group consisting of titanium, lead and mixtures thereof.

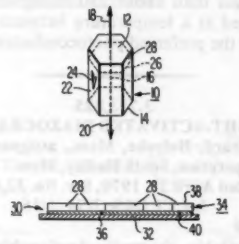
3,713,820
ELECTROPHOTOGRAPHIC CHARGE TRANSPORT LAYER
Robert B. Champ, San Jose, Albert J. Cherry, Morgan Hill, and Meredith D. Shattuck, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 886,786, Dec. 19, 1969. This application Sept. 7, 1971, Ser. No. 178,493
Int. Cl. G03g 5/02, 13/22
U.S. Cl. 96—1.5 6 Claims

An electrophotographic plate in which the photoconductor is overcoated with a charge transport layer of polyamide which is formed from linoleic acid and ethylene diamine and which has a resistivity of at least 10^{10} ohm cm. and a dark decay time of less than ten seconds.

3,713,821
PHOTORECEPTOR INTERFACE
Dominic J. Angelini, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed June 10, 1971, Ser. No. 151,659
Int. Cl. G03g 5/10, 5/00
U.S. Cl. 96—1.5 17 Claims

An organic interface suitable for use with a photoconductive insulating layer, said interface comprising a polymer blend or mixture of polycarbonate and polyurethane resins. The interface or blocking layer is normally used as a layer which is sandwiched between a photoconductive insulating layer and a supporting substrate. The interface composition exhibits outstanding mechanical properties and electrical characteristics.

3,713,822
PYROELECTRIC PHOTOCONDUCTIVE ELEMENTS AND METHOD OF CHARGING SAME
Helmut Gustav Kiess, Hightstown, N.J., assignor to RCA Corporation
Filed Aug. 31, 1970, Ser. No. 68,067
Int. Cl. G03g 5/02, 13/02
U.S. Cl. 96—1.5 11 Claims



The recording element comprises an electrically conductive substrate and a layer of a photoconductive, pyroelectric compound on the substrate. The layer comprises one or more wafers of the pyroelectric compound, each wafer being similarly oriented on the substrate so that its polar *c*-axis is transverse to the opposite large surfaces of the layer. The novel electrophotographic recording element is charged by merely changing the temperature of the layer a few degrees.

3,713,823
PHOTOGRAPHIC CONTRAST CONTROL
Elliot Berman, Quincy, and Richard W. Philbrick, Concord, Mass., assignors to Itek Corporation, Lexington, Mass.
Filed Aug. 30, 1967, Ser. No. 664,479
Int. Cl. G03c 5/24
U.S. Cl. 96—48 HD 9 Claims

Methods of grossly or locally altering contrast in photographic images, in systems in which an image is reversibly formed prior to development, by heating the imaging medium prior to development and/or varying the period of time between image formation and development.

3,713,824
PHYSICAL DEVELOPMENT UTILIZING 1-PHENYL-3-PYRAZOLIDONE OR A BENZENE DIAMINE COMBINED WITH A POLYHYDROXYBENZENE IN ACIDIC MEDIUM
John R. Manhardt, Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.
No Drawing. Filed Jan. 5, 1970, Ser. No. 812
Int. Cl. G03c 5/24
U.S. Cl. 96—48 PD 30 Claims

This invention relates to physical development of a photographic reproduction system with a physical developer. The step of physical development comprises contacting an exposed photosensitive layer containing the oxidizing component of a chemical redox system, such as silver nitrate, with the reducing component of the redox system where the reducing component is a mixture of a slow-acting reducing agent and a fast-acting reducing agent. The use of a mixed reducing agent as described

permits development of images of improved density and contrast because development initiates and takes place within the photosensitive layer rather than on its surface or beyond its surface as typically encountered with prior art developers. An overall process in accordance with the invention comprises selectively exposing the reproduction system to activating radiation and developing in the manner above described. A portion or all of the oxidizing component of the redox system may be contained within the photosensitive layer at the time of exposure to give a direct read-out or it is possible to apply all of the oxidizing component at a time subsequent to exposure followed by contact with the reducing portion of the redox system. A photosensitive layer comprising a photoconductor that becomes reversibly activated upon exposure to activating radiation is preferred. Titanium dioxide having a particle size less than about 250 millimicrons and which has been heated at a temperature between about 200° C. and 950° C. is the preferred photoconductor.

3,713,825

LIGHT-ACTIVATED DIAZOGRAPHY

Eric Lionel Girard, Holyoke, Mass., assignor to The Plastic Coating Corporation, South Hadley, Mass.

Filed April 27, 1970, Ser. No. 32,420
Int. Cl. G03c *5/34, 1/56*
U.S. Cl. 96—49 **9 Claims**

A light-activatable, thermally developable diazosulfonate reproduction material and methods of imaging same.

3,713,826

SULFITE ESTERS AS PRESERVATIVES FOR BLACK AND WHITE DEVELOPING AGENTS

Donald J. Sykes, Upper Saddle River, N.J., Harry Kroll, Warwick, R.I., and Theron R. Finch, Northvale, N.J., assignors to Philip A. Hunt Chemical Corporation, Palisades Park, N.J.

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,025
Int. Cl. G03c *5/30*
U.S. Cl. 96—66.4 **9 Claims**

A method of and solution for black and white developing of silver halide gelatin layers with the use of a bath that includes a conventional black and white developing agent or agents and other conventional constituents such as restrainers, anti-foggants, sequestrants, silver halide solvents and gelatin hardeners and which for the preservative uses a sulfite ester selected from the class consisting of 1,2-ethylenesulfite; 1-methyl-1,2-ethylenesulfite; 1,2-dimethyl-1,2-ethylenesulfite; 1,3-propylenesulfite and dimethylsulfite in the presence of an alkali in an amount sufficient to provide for the bath a pH of at least 8.

3,713,827

PROCESS FOR THE DEVELOPMENT OF PHOTOGRAPHIC MATERIAL

Jozef Frans Willems, Wilrijk, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Oct. 7, 1970, Ser. No. 78,937
Claims priority, application Great Britain, Oct. 27, 1969, 52,569/69
Int. Cl. G03c *5/30*
U.S. Cl. 96—66.3 **7 Claims**

A method of developing exposed photographic silver halide elements is described according to which an aqueous alkaline composition is used in the presence of an anionic silver halide developing agent and a diquaternary cyclic ammonium salt which by the uptake of 1 electron forms stable Weitz radicals. The diquaternary cyclic ammonium salts accelerate development and the development accelerating effect surpasses that of related quaternary ammonium compounds that do not form stable Weitz radicals.

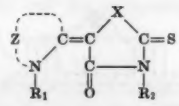
3,713,828

MULTI-LAYER COLOR PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIALS

Jun Hayashi, and Akira Sato, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami, Ashigara-shi, Kanagawa, Japan

Filed Sept. 8, 1970, Ser. No. 70,554
Claims priority, application Japan, Sept. 5, 1969, 44/70681
Int. Cl. G03c *1/76, 3/00*
U.S. Cl. 96—74 **10 Claims**

A multi-layer type color photographic light-sensitive material characterized in that a merocyanine dye having the following general formula I



wherein X is selected from the group consisting of a sulfur atom, a selenium atom, an oxygen atom, and

wherein each of R_1, R_2 and R_3 is selected from the group consisting of a hydrogen atom, an alkyl group, a substituted alkyl group, an aryl group, and a substituted aryl group; and wherein Z represents an atomic group necessary to complete a heterocyclic ring, which may be substituted, is incorporated in at least one layer of the multi-layer type color photographic light-sensitive material, said multi-layer type color photographic light-sensitive material having on a support at least two silver halide photographic emulsion layers is disclosed.

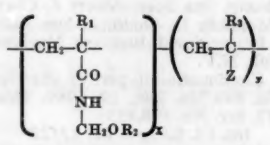
3,713,829

PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL CONTAINING COPOLYMER LAYER

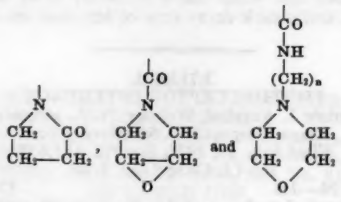
Fumihiko Nishio; Daijiro Nishio; Syu Watarai; Kinji Ohkubo, and Yosuke Nakajima, Minami-Ashigara Machi, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara-shi, Kanagawa, Japan

Continuation-in-part of Ser. No. 554,048, May 31, 1966, abandoned. This application Sept. 30, 1971, Ser. No. 188,701
Claims priority, application Japan, June 1, 1965, 40/32032
Int. Cl. G03c *1/04, 1/88*
U.S. Cl. 96—85 **11 Claims**

A light-sensitive photographic material having at least one layer containing a copolymer represented by the general formula:



wherein R_1 and R_3 can be H or CH_3, R_2 can be an alkyl group having one to three carbon atoms, *x* and *y* represent positive integers, and Z represents one of:



where *n* is 1–3, exhibits reduced curling upon exposure to moisture.

3,713,830

PRESENSITIZED LITHOGRAPHIC PRINTING PLATE AND PROCESS FOR PREPARING SAME

Leonard James Watkinson, Leeds, England, assignor to Howson-Algraphy Limited, Leeds, Yorkshire, England

No Drawing. Filed Dec. 24, 1970, Ser. No. 101,388

Int. Cl. G03c *1/94, 1/00;* G03f *7/02*

U.S. Cl. 96—86 R 13 Claims

A presensitised printing plate comprises a support sheet of aluminium or aluminium alloy having a surface which has been anodised using aqueous phosphoric acid as electrolyte. A layer of light sensitive material comprising a mixture of a novolak resin and a diazo salt is applied to the anodised surface. The diazo salt may be used in the form of a stable double salt or a stable complex. The presensitised printing plate is storage stable for long periods and, on processing gives rise to a lithographic printing plate capable of producing many copies.

3,713,831

COATING COMPOSITION COMPRISING PHOTOACTIVATOR AND FILM-FORMING ORGANIC MATERIAL FOR POWDER DEVELOPMENT

Lester P. Hayes; Rexford W. Jones, both of Decatur, Ill., and William B. Thompson, Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation-in-part of Ser. No. 796,847, Feb. 5, 1969, Pat. No. 3,637,385. This application Aug. 22, 1969, Ser. No. 852,914

Int. Cl. G03c *1/00*

U.S. Cl. 96—88 35 Claims

Storage stable coating compositions suitable for the preparation of solid, light-sensitive organic layers utilizable in deformation imaging comprising a liquid vehicle, a film forming organic material and a photoactivator capable of producing free radicals.

3,713,832

SOLARIZATION TYPE SILVER HALIDE EMULSION CONTAINING A HALOGENATED HYDROXYPHTHALEIN SENSITIZING DYE AND A DESENSITIZING COMPOUND

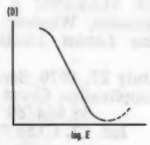
Keisuke Shiba; Masanao Hinata, and Masao Sawahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami, Ashigara-shi, Kanagawa, Japan

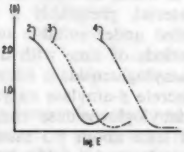
Filed July 15, 1969, Ser. No. 841,717

Claims priority, application Japan, July 15, 1968, 43/49815

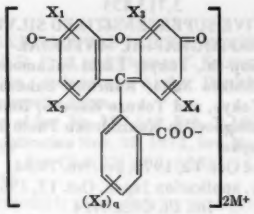
Int. Cl. G03c *1/36*

U.S. Cl. 96—101 16 Claims

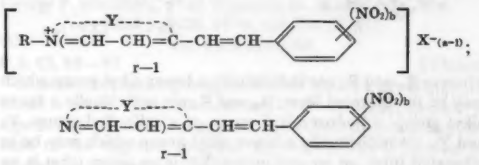




A direct positive silver halide photographic emulsion illustrates improved qualities when it contains at least one dye represented by the following general formula:



and at least one desensitizing compound represented by either of the following two general formulas:



X_1, X_2, X_3, X_4, or X_5 can be hydrogen atom or a halogen atom, q can be 1, 2, 3 or 4, M can be a hydrogen atom, an alkali metal, NH_4 or an alkaline earth metal, Y represents non-metallic atoms necessary to complete a heterocyclic ring, R can be an alkyl group or a substituted alkyl group, a, b, and r can be 1 or 2, and X represents an anion.

3,713,833

PREPARATION OF SILVER SALTS IN AN ORGANIC LIQUID MEDIUM

Robert Derwood Lindholm, Rochester, and Kenneth Robert Hollister, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1970, Ser. No. 84,923

Int. Cl. G03c *1/04*

U.S. Cl. 96—114 9 Claims

Photographic silver halide salt compositions are formed in the presence of certain synthetic polymers in an organic solvent medium. In one aspect, silver halide grains having metal ions occluded therein can be made by this technique. In another aspect, inorganic silver halide slats made by this technique can be admixed with organic silver salts in an organic solvent and coated on a support to provide improved heat-developable photographic elements.

3,713,834

POLYMERIC BINDERS FOR PHOTOGRAPHIC EMULSIONS

Maurice J. Fitzgerald, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed July 6, 1971, Ser. No. 160,092

Int. Cl. G03c *1/04*

U.S. Cl. 96—114 24 Claims

A photosensitive silver halide emulsion wherein the emulsion binder comprises an amine-diamide polymer or copolymer.

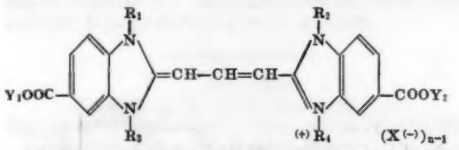
3,713,835

LIGHT-SENSITIVE SUPERSENSITIZED SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shui Sato, Hachioji-shi, Tokyo; Eiichi Sakamoto, Hanno-shi, Saitama-ken; Shizuo Saito; Kaiichiro Sakazume, both of Hachioji-shi, Tokyo, and Tokuzo Kaneko, Hino-shi, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

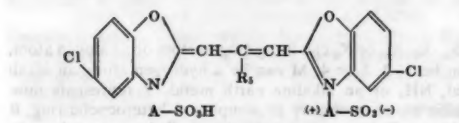
Filed Oct. 12, 1970, Ser. No. 79,941
Claims priority, application Japan, Oct. 13, 1969, 44/81151
Int. Cl. G03c 1/14
U.S. Cl. 96—124 9 Claims

Light-sensitive silver halide photographic material characterized by containing in the silver halide photographic emulsion layer thereof a combination of sensitizing dyes comprising at least one compound represented by the general formula (I),



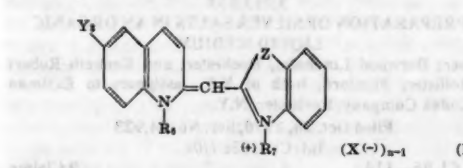
(I)

wherein R_1 and R_2 are individually a lower alkyl group which may be in etherated form; R_3 and R_4 are individually a lower alkyl group, a hydroxyalkyl group or a sulfoalkyl group; Y_1 and Y_2 are individually a lower alkyl group which may be in etherated form, or an aryl group; $X^{(-)}$ is an anion (that is an acid anion); and n is an integer of 1 or 2, with at least one compound represented by the general formula (II),



(II)

wherein R_5 is a lower alkyl group; and A is an alkylene group, or a combination of said compounds with at least one compound represented by the general formula (III),



(III)

wherein R_6 is a lower alkyl group; R_7 is a lower alkyl group, a hydroxyalkyl group, a carboxyalkyl group or a sulfoalkyl group; Y_3 is a hydrogen atom, a lower alkyl group or a lower alkoxy group; Z is S or Se: X^- is a negative group; and n is an integer of 1 or 2.

3,713,836

PROCESS OF PRODUCING A COMPOSITION FOR CONTROLLING THE BACTERIAL FLORA IN THE INTESTINES OF ANIMALS

Carl Gosta Carlsson, Angelholm, Sweden, assignor to AB Cernelle, Angelholm, Sweden

No Drawing. Filed Mar. 10, 1970, Ser. No. 18,303
Claims priority, application Sweden, Oct. 13, 1969, 13,996/69
Int. Cl. A23k 1/00
U.S. Cl. 99—2 VM 8 Claims

A composition is prepared by cultivation of a strain of *Streptococcus faecium* in an aqueous nutrient medium under anaerobic conditions. The resulting bulk of bacteria is separated and possibly subjected to freeze-drying. The composition is administered to domestic animals and is capable of controlling the bacterial flora in the intestines, resulting in an increased growth of the animals.

3,713,837

FREEZE-THAW CYCLE FOR JUICY SAUSAGE ANALOG

Harold T. Leidy, New City, N.Y.; Charles M. Kerrigan, Wayne, N.J., and Duane C. Byble, Ossining, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

No Drawing. Continuation-in-part of Ser. No. 35,267, May 6, 1970. This application Aug. 20, 1970, Ser. No. 65,717
Int. Cl. A23j 3/00
U.S. Cl. 99—17 2 Claims

A sausage meat analog is formed utilizing a vegetable protein gel with a rendered animal fat and/or vegetable oil and a preferred additional protein gel source albumen, casein, whey or combinations. Additional juiciness is introduced into the protein gel system by freezing the product with subsequent thawing.

3,713,838

PROCESS FOR OBTAINING A BEER FLAVORING

Erich Ziegler, D-8551 Aufsess/Ofr., Bavaria, Germany

Filed Dec. 31, 1970, Ser. No. 103,192
Int. Cl. A23l 1/26
U.S. Cl. 99—28 18 Claims

Beer flavoring substances are obtained from the yeast containing dregs obtained in brewing, preferably by fractional distillation or solvent extraction. The flavoring substance consists of an oil having an intensive odor and a density at 20°C ranging from about 0.85 to 0.89 and is soluble in an 80 percent ethyl alcohol solution in all ratios. The flavoring substance or an alcohol solution of the same is added to various foods and beverages.

3,713,839

FERMENTATION PROCESS

Jacques J. Delente, University City; Elmer W. Lueckerath, Ferguston; Cavit Akin, Chicago, all of Ill., and Erik Krabbe, Webster Groves, Mo.

Continuation of Ser. No. 695,274, Jan. 2, 1968, abandoned. This application Feb. 22, 1971, Ser. No. 117,821
Int. Cl. C12c 11/04; C12b 1/00
U.S. Cl. 99—31 3 Claims

The process of handling fermenting medium such that the carbon dioxide released during fermentation is applied to the problem of creating an agitation regime for desirable product quality and heat dissipation, and apparatus having depth and bottom shapes that determine the agitation pattern and assist in heat dissipation.

3,713,840

PROCESS FOR MAKING A BREWERS' WORT

Richard C. Quittenton, Windsor, Ontario, Canada, assignor to John Labatt Limited, London, Ontario, Canada

Filed July 27, 1970, Ser. No. 58,630
Claims priority, application Great Britain, July 29, 1969, 38,064/69
Int. Cl. C12c 7/00
U.S. Cl. 99—51 18 Claims

This invention provides a process for producing a brewers' wort in which an aqueous slurry of a raw starch-containing material, preferably a cereal grain such as barley, is treated under suitable temperature conditions for defined periods of time with discrete proteolytic, α-amylase and amyloglucosidase enzymes and a β-amylase source or a discrete β-amylase enzyme the proteolytic, α-amylase and amyloglucosidase enzyme being present in amounts of at least about 0.5 modified Kunitz protease units per gm., at least about 45, preferably at least about 100, modified Stein-Fischer α-amylase units per gm. and at least 6.0×10^{-3}, preferably at least about 1.0×10^{-1}

amyloglucosidase (AG) units per gm. of starch-containing material respectively. The β-amylase source is conveniently malt present in an amount of no more than about 30% by weight, preferably between about 8% and 20% by weight, so that the traditional reliance upon malt (a relatively expensive and complex material) is greatly lessened. Preferably the mash bill includes up to about 60% by weight, of a cereal adjunct, say, liquefied corn grits. Preferred embodiments of this invention involve novel mash cycles based on defined temperature and time parameters.

This invention also includes a process for producing beer or like non-distilled, alcoholic beverage from such brewers' worts.

3,713,841

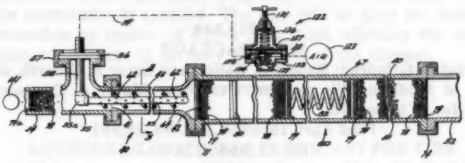
WHIPPING APPARATUS AND METHOD

John MacManus, 143—16 22nd Road, Whitestone, N.Y. 11357

Continuation of application Ser. No. 571,885, Aug. 11, 1966. This application June 27, 1969, Ser. No. 837,087

Int. Cl. B01f *15/02, 13/02, 5/04*

U.S. Cl. 99—60 **12 Claims**



A static whipping apparatus, preferably for whipping animal or vegetable fat cream, including a large refrigerated storage vessel, a pump for pumping therefrom to a gas injection chember where gas is injected in a plurality of streams, and then to a static whipping tube having irregular impediments of synthetic resin therein.

3,713,842

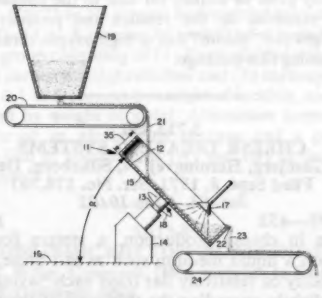
AGGLOMERATION OF ROAST AND GROUND COFFEE WITH INSTANT COFFEE SOLUBLES

Timothy A. Lubsen, Cincinnati; Frederick M. Joffe, Wyoming; Paulee Gregory, Forest Park, and Joseph R. McSwiggin, Cincinnati, all of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Dec. 10, 1970, Ser. No. 96,821

Int. Cl. A23s *1/04*

U.S. Cl. 99—65 **12 Claims**



A method of pan agglomerating roast and ground coffee using instant coffee extract as an agglomerating agent. The method yields a product which is approximately 25 percent lower in tamped bulk density than roast and ground coffee and yet equal in brew flavor strength to conventional roast and ground coffee.

3,713,843

WATER SOLUBLE PROTEIN MATERIALS

Akiva Pour-el, St. Paul, and Thomas C. Swenson, Bloomington, both of Minn., assignors to Archer Daniels Midland Company, Minneapolis, Minn.

Continuation of Ser. No. 797,669, Feb. 7, 1969, abandoned. This application Nov. 30, 1971, Ser. No. 203,443

Int. Cl. A23l *1/00*; **A23j** *1/14*

U.S. Cl. 99—79 **9 Claims**

Dispersed insoluble plant proteins are digested with acid active enzymes under quiescent acidic conditions to completely dissolve the insoluble colloidal protein within the reaction medium. Following the digestion, the reaction medium is centrifuged and freeze-dried to form a soluble proteinaceous powder. The soluble protein can be included within carbonated or non-carbonated acidic beverages.

3,713,844

DOUGH MAKING METHOD

George P. Sternberg, 3740 Wyoming St., Kansas City, Mo.

Filed July 28, 1970, Ser. No. 59,021

Int. Cl. A21d *8/04*

U.S. Cl. 99—91 **2 Claims**

A method of making dough for bread and roll production in which a warm slurry of flour and malt or other amylase is digested to produce a digested starch product, reducing the bulk of the digested material by evaporation or drying to produce a condensed product which may be either a heavy syrup or a completely dried product which can be ground into a powder. This digested starch product is added to the fermentable dough mixture comprising flour, water, sugar, salt, yeast and other ingredients and mixed therewith. The ferment in the dough can be either obtained from a brew or a sponge that has been fermented. Preferably the dough contains approximately from 2 to 4 pounds of digested starch product to approximately 100 pounds of flour, the amount used can be either added to the usual 100 pounds of flour or can be included as part of the 100 pounds of flour as ordinarily stated in bread and roll dough formulas.

3,713,845

CHIFFON CAKE MIX

Richard A. Kuffel, St. Louis Park, Minn., assignor to General Mills, Inc.

Filed Nov. 5, 1970, Ser. No. 87,329

Int. Cl. A21d *2/00, 2/02*

U.S. Cl. 99—94 **6 Claims**

Chiffon cake mix using starch as the amylaceous ingredient. This chiffon cake mix exhibits a stable foam structure during the preparation operation thus avoiding one of the major disadvantages encountered in using previously known chiffon cake mixes.

3,713,846

METHOD FOR COOKING MEAT PRODUCTS

William J. Turner, Oak Lawn; Wayne E. Henry, Downers Grove, and Gary W. Hubb, Western Springs, all of Ill., assignors to The Griffith Laboratories, Inc., Chicago, Ill.

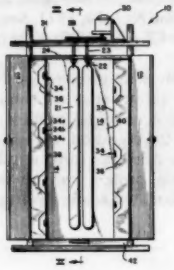
Division of Ser. No. 864,463, Oct. 7, 1969, Pat. No. 3,559,564, which is a continuation-in-part of Ser. No. 701,442, Jan. 29, 1968, abandoned. This application Aug. 26, 1970, Ser. No. 67,174

Int. Cl. A22c *11/00, 18/00*; **B65b** *55/02*

U.S. Cl. 99—107 **6 Claims**

Methods and apparatus for cooking meat products confined in casings which utilize the application of controlled intense

infrared radiation. In the cooking process an intense infrared radiation source heating the product is impulsed by rapidly



turning the source on and off in a cyclic manner. This enables a commercially good product to be obtained in significantly less time than is normally required in the prior art.

3,713,847

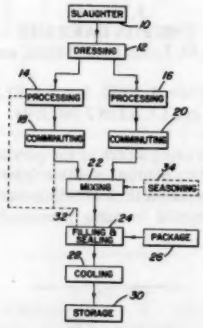
PROCESS FOR PREPARING PACKAGED BEEF PRODUCTS FOR PROLONGED STORAGE

Virgil W. Vogel, deceased, by Virgil J. Vogel, co-executor, P.O. Box 670, Pekin, Ill. 61554, and Paul W. Vogel, Pekin, Ill. (Bonne Terre Sausage Company, P.O. Box 270, Bonne Terre, Mo. 63628)

Continuation of application Ser. No. 338,158, Jan. 16, 1964, which is a continuation-in-part of application Ser. No. 48,561, Aug. 10, 1960, now Patent No. 3,124,462. This application Jan. 21, 1971, Ser. No. 108,475

Int. Cl. A22c *18/00*; B65b *25/06*

U.S. Cl. 99—108 **9 Claims**



A process for preparing packaged meat in which the meat is removed from a freshly slaughtered carcass while at substantially bleeding temperature under ambient temperature conditions, comminuting the meat under these conditions, sealing the comminuted meat within a flexible packaging material before the meat temperature has declined to ambient temperature, and rapidly reducing the temperature of the packaged meat to a storage temperature.

3,713,848

FLAVORING PROCESSES AND COMPOSITIONS INVOLVING BRANCHED-CHAIN ALKANETHIOLS

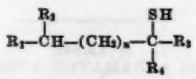
Ira Katz, Elberon, Richard A. Wilson, Edison, and Cynthia J. Mussinan, Bricktown, N.J., assignors to International Flavor & Fragrances Inc., New York, N.Y.

No Drawing. Filed Apr. 19, 1971, Ser. No. 135,337

Int. Cl. A23l *1/26*

U.S. Cl. 99—140 R **7 Claims**

Processes for altering the flavor of foodstuffs which comprise adding thereto at least one branched-chain alkanethiol having the formula;



wherein R_1, R_2, R_3 and R_4 are the same or different alkyl groups or hydrogen, at least two of R_1, R_2, R_3 and R_4 being alkyl and at least one of R_1, R_2, R_3 and R_4 being hydrogen; and n is 0 or 1, together with compositions incorporating such thiols for altering the flavor of foodstuffs.

3,713,849

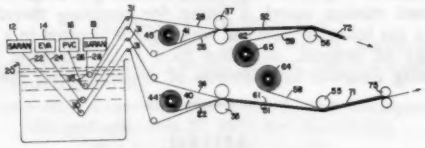
MEAT PACKAGE

Paul E. Grindrod; Robert L. Goller, and Oscar E. Seiferth, all of Madison, Wis., assignors to Oscar Mayer & Company Inc., Chicago, Ill.

Filed April 15, 1970, Ser. No. 28,591

Int. Cl. B65b *25/06*

U.S. Cl. 99—174 **9 Claims**



A fresh meat package in which an outer oxygen impermeable lamina is readily and entirely peelable from an inner oxygen-permeable lamina. The package includes means for initiating the peeling separation along an edge of the package. The package, and method for manufacturing of same, is directed to the central packaging of fresh or fresh-frozen meats. Outer oxygen barrier maintains meats in well preserved condition in spite of purplish color having low consumer appeal. Shortly prior to display for sale to the consumer outer lamina is removed by the retailer and product develops healthy bright red "bloom" due to high oxygen through-put of inner remaining film package.

3,713,850

CHEESE TREATING SYSTEMS

Knud Gasbjerg, Herningvej 74, Silkeborg, Denmark

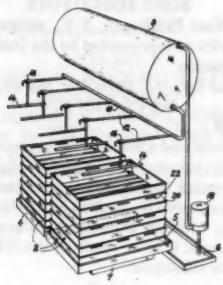
Filed Sept. 8, 1971, Ser. No. 178,707

Int. Cl. A23c *19/02*

U.S. Cl. 99—452 **10 Claims**

For use in cheese production, a system for treating cheeses with a liquid medium such as salt brine, comprising a plurality of relatively flat trays each having a height or depth slightly exceeding the thickness of the cheeses to be treated and each being able to receive one layer of cheeses, said trays being stackable into a pile of trays, means being provided for supplying brine to the uppermost tray whereby when this tray is full the brine will be let out through an overrun down into the next tray for

filling the same, and so forth all the way down through the pile whereby all cheeses in the trays will be subjected to the brine. Preferably, in order to facilitate emptying of the trays, each tray has one or more narrow bottom holes through which, after closing of the brine supply to the



uppermost tray, the rest of the brine may leave the single trays down into the underlying tray whereby the trays will be consecutively emptied. The tray pile or piles are easily movable by means of e.g. a fork truck whereby the system contributes to an easy handling of the cheeses.

3,713,851

AQUEOUS SILOXANE BAG LUBRICANT FOR TIRE MOLDING

Joseph Cekada, Jr., 1827 Eastlawn, Midland, Mich.

Continuation-in-part of Ser. No. 148,899, June 1, 1971, which is a continuation-in-part of Ser. No. 40,452, May 25, 1970, abandoned. This application Jan. 5, 1972, Ser. No. 215,642

Int. Cl. B28b *7/36*

U.S. Cl. 106—38.22 **10 Claims**

A composition useful as a bag lubricant in tire manufacturing is disclosed which composition consists essentially of (A) 1 to 20 percent by weight of an alkylmethyl-siloxane fluid having from one to 20 carbon atoms in the alkyl group and at least 1000 cs. viscosity at 25° C., (B) 2 to 20 percent by weight of a material selected from the group consisting of (1) polyalkylene glycols having a molecular weight of at least 500 in which the alkylene oxide units are ethylene oxide units, propylene oxide units or combinations of ethylene oxide and propylene oxide units and (2) copolymers of alkylmethylsiloxanes and polyalkylene glycols in which the alkylene oxide units are ethylene oxide units, propylene oxide units or combinations of ethylene oxide and propylene oxide units, said copolymers having a viscosity of at least 200 cs. at 25°C. and containing from 5 to 50 percent by weight of the alkylmethylsiloxanes, (C) 25 to 50 percent by weight of mica of 75 to 600 mesh, (D) 0.1 to 5 percent by weight of a material selected from the group consisting of (1) finely divided magnesium silicate, (2) carboxymethyl cellulose and (3) carboxyethyl cellulose, (E) 0.1 to 5 percent by weight of lecithin, and (F) 15 to 55 percent by weight of water. Alternative formulation is a copolymer of an alkylmethyl siloxane and a polyalkylene glycol in lieu of components (A) and (B) in the preceding composition.

3,713,852

EXOTHERMIC HOT TOPPING COMPOSITION

Donald E. Wiley, Conneaut, Ohio, assignor to Exomet, Incorporated, Conneaut, Ohio

Filed Oct. 5, 1970, Ser. No. 78,218

Int. Cl. B28b *7/36*

U.S. Cl. 106—38.27 **2 Claims**

Minimized smoke evolution and controlled reaction of exothermic hot topping compositions are obtained by a mixture of an oxidizer and a fuel together with bulk or modifying constituents. The improved properties are achieved by control of composition and particle size of ingredients and in certain instances agglomerating the mixture into a pelletized form.

3,713,853

CERAMIC DIELECTRIC MATERIALS OF PEROVSKITE BARIUM-LEAD SODIUM NIOBATE

Yoshihiro Matsuo, 27–4 Ishizu Higashi-cho, Neyagawa-shi; Hiromu Sasaki, 546–39 Oaza Kamishimagashira, Kadoma-shi; and Shigeru Hayakawa, 7–16–13 Korigaoka, Hirakata-shi, all of Osaka, Japan

Filed June 12, 1970, Ser. No. 45,869

Int. Cl. C04b *33/00*

U.S. Cl. 106—39.5 **3 Claims**

A ceramic material in a perovskite structure having a high dielectric permittivity, a low power factor and a low temperature coefficient of permittivity, the composition of which is in a chemical formula of

$$(Ba_xPb_{1-x})(Na_{0.25}Nb_{0.75})O_3$$

wherein x ranges from 0.40 to 0.95 in accordance with the inventions. The ceramic dielectric composition of

$$(Ba_xPb_{1-x})(Na_{0.25}Nb_{0.75})O_3$$

can be modified by substitution of Sr for Ba or Li for Na in accordance with the inventions.

3,713,854

REDUCED SILICA-NUCLEATED GLASS-CERAMIC ARTICLES

George H. Beall, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of application Ser. No. 699,048, Jan. 19, 1968. This application Sept. 8, 1971, Ser. No. 178,719

Int. Cl. C04b *33/00*

U.S. Cl. 106—39 DV **8 Claims**

This invention relates to the manufacture of glass-ceramic articles from essentially any thermally crystallizable silicate base glass composition utilizing reduced silica as a nucleating agent. Silicon metal may be incorporated into the batch, or other strongly reducing constituents may be added so that a part of the silica in the melt will be reduced to either silicon monoxide or elemental silicon.

3,713,855

PRODUCTION OF BASIC REFRACTORIES

Edmund S. Wright, Clearfield, Pa., assignor to Eltra Corporation, Toledo, Ohio

Filed Mar. 24, 1971, Ser. No. 127,665

Int. Cl. C04b *35/04*

U.S. Cl. 106—58 **8 Claims**

An improved method for producing a high MgO refractory, having lime and silica as the major impurities is disclosed. The method involves preparing a batch of size-graded periclase particles, tempering the batch, forming the tempered batch into a shape, drying the shape and firing the shape. According to the invention, at least 0.1 percent by weight of a calcium compound, calculated as CaO and based on the dry weight of the batch, is dissolved in the tempering liquid, the weight ratio of lime to silica is controlled to one from 1.5:1 to 2.6:1, and firing is controlled so that the overall refractoriness of the accessory phases is increased. Preferably, the CaO/SiO_2 ratio and firing are controlled so that dicalcium silicate is formed as the principal accessory phase. The addition of silica, in addition to the dissolved calcium compound, to control the CaO/SiO_2 ratio is also disclosed.

3,713,856

PAVING COMPOSITION AND METHOD OF MAKING IT

Kenneth E. McConnaughay, P.O. Box 1457, Lafayette, Ind.

Continuation-in-part of Ser. No. 48,513, June 22, 1970, abandoned. This application Jan. 27, 1972, Ser. No. 221,441
Int. Cl. C04b 7/02
U.S. Cl. 106—96 8 Claims

A paving composition and method of making it in which an aggregate is mixed with a bituminous material to coat the aggregate particles with a bituminous film. After coating, the aggregate is mixed with Portland cement and water and the resulting paving composition is spread on the surface to be paved.

3,713,857

PHTHALOCYANINE PIGMENTS

Leonard Shapiro, East Brunswick, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,943
Int. Cl. C08b 17/14
U.S. Cl. 106—288 Q 11 Claims

Organic pigments having improved heat stability and dispersibility are obtained by pasting the crude pigment with sulfuric acid in the presence of (a) a salt of an aromatic sulfonic acid or (b) free aromatic sulfonic acid plus sodium sulfate.

3,713,858

PIGMENT RECOVERY

Frank J. Eckert, Marrisville, Pa., assignor to Cities Service Company, New York, N.Y.

Filed Nov. 23, 1970, Ser. No. 92,326
Int. Cl. C09c 1/14
U.S. Cl. 106—291 7 Claims

Crystal platelets of basic lead carbonate which are suspended in the mother liquor are classified according to size by means of a wet cyclone classifier. An underflow stream is recovered from the wet cyclone classifier and contains crystal platelets having an average diameter within the range of about 10 to about 20 microns. Platelets having an average diameter in this range are especially preferred since they are pearlescent and have a luster and brilliance which equals or excells that of natural pearl essence. An overflow stream is also removed from the wet cyclone classifier and contains crystal platelets having an average diameter of below about 10 microns. These under-size crystals are subjected to a size-enlargement step and are then returned to the cyclone classifier for separation with respect to size.

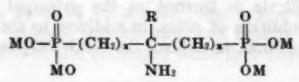
3,713,859

DISPERSING CLAYS, PIGMENTS AND THE LIKE WITH AMINO

Merwin Frederick Hoover, Pittsburgh, and Gloria DiMarco Sinkovitz, Bridgeville, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Nov. 18, 1970, Ser. No. 90,857
Int. Cl. C09c 1/42, 3/02
U.S. Cl. 106—308 N 9 Claims

The disclosure is directed to the use of water-soluble amino diphosphonates as deflocculating agents for finely divided solid materials in an aqueous dispersion, slurry and the like, especially as deflocculating agents for the preparation of high solids, low viscosity slurries of pigments and clays for use in paper coatings. The useful amino diphosphonates are represented by the following formula



where R is an alkyl group of one to five carbon atoms, phenyl or benzyl and where x is 0 or 1 and where each M is independently selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, and ammonium.

3,713,860

BONE SUBSTITUTE

Allan Auskern, East Patchogue, N.Y., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 31, 1970, Ser. No. 68,578
Int. Cl. A61f 1/24
U.S. Cl. 117—8.5 5 Claims

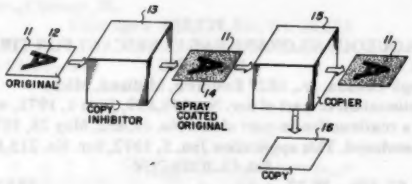
A bone substitute and a method for preparing the bone substitute in which porous aluminum oxide is initially impregnated with pure methyl methacrylate monomer. The monomer is polymerized by gamma irradiation and polymer is then removed by solution from selected areas where muscle and bone attachment is to be made in situ. Further irradiation sterilizes the bone substitute.

3,713,861

INHIBITOR DEVICE

James H. Sharp, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 4, 1969, Ser. No. 882,186
Int. Cl. B44d 15/00; C09k 1/00
U.S. Cl. 117—15 16 Claims



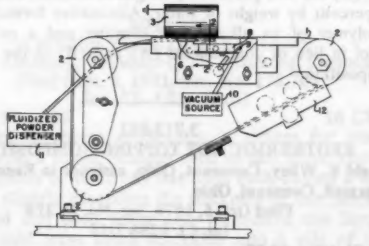
A method of rendering a document copy-proof by overcoating the document with a film of a selected fluorescent material so that light emanating from an exposure source onto the document fluoresces in the image areas of the document as well as in the background areas. As a result, no image impression is made on the photosensitive element of the copying device.

3,713,862

METHOD FOR PIGMENTED SIDE STRIPING OF CAN BODIES

Robert A. Winkless, Oak Lawn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 767,582, Oct. 3, 1968, abandoned. This application Nov. 16, 1970, Ser. No. 89,958
Int. Cl. B05b 5/02; B44d 1/09, 1/094
U.S. Cl. 117—17.5 9 Claims



A method for side striping cans which uses a single belt having slots of can seam length along its middle. A stream of

fluidized powder is shaped and is jetted toward the side seam of the can at an angle less than 30 degrees. The side seam of the can is moving at a uniform speed and in this way the powdered material settles onto the can side seam with an even distribution of powdered material across each lateral unit of the side seam. The edges of the stripe are sharp because the side seam lies in the segmented belt.

3,713,863

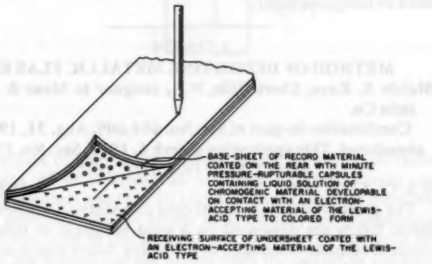
MARK-FORMING RECORD MATERIALS AND PROCESS

Chao-Han Lin, Dayton, and Arthur J. Wright, Cincinnati, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

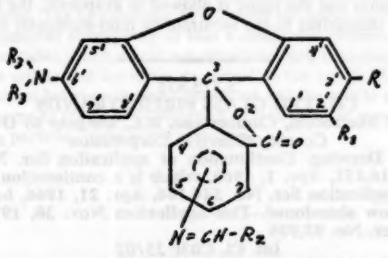
Original application Jan. 21, 1969, Ser. No. 792,277, now Patent No. 3,641,011. Divided and this application Jan. 11, 1971, Ser. No. 105,600

Int. Cl. B41m 5/22

U.S. Cl. 117—36.2 **13 Claims**


BASE-SHEET OF RECORD MATERIAL COATED ON THE REAR WITH MINUTE PRESSURE-RUPTURABLE CAPSULES CONTAINING LIQUID SOLUTION OF CHROMOGENIC MATERIAL DEVELOPABLE ON CONTACT WITH AN ELECTRON-ACCEPTING MATERIAL OF THE LEWIS-ACID TYPE TO COLORED FORM
RECEIVING SURFACE OF UNDERSHEET COATED WITH AN ELECTRON-ACCEPTING MATERIAL OF THE LEWIS-ACID TYPE

A novel chromogenic material of normally colorless form is disclosed, having a structural formula:



wherein R_2 represents a dialkylaminophenyl radical, R and R_1 comprise hydrogen, halogen, and alkyl radicals and R_3 represents alkyl radicals having less than five carbon atoms; said materials assuming a colored form upon reactive contact with a Lewis acid molecule. Examples include 6'-diethylamino - 5 - (p-dimethylaminobenzylidene) amino-2',3'-dimethylfluoran and 2'-chloro - 6' - diethylamino-6-(p - dimethylaminobenzylidene)amino-3'-methylfluoran.

3,713,864

METHOD OF PRINTING OR COATING USING ACTINIC RADIATION SETTING OF APPLIED COATING AND COATED PRODUCT

Joseph Francis Ackerman, Cedar Grove, George Beerli, Arlington, Robert George Savageau, Pompton Lakes, and Joseph Weisfeld, Fair Lawn, N.J., assignors to Inmont Corporation, New York, N.Y.

Original application Jan. 6, 1971, Ser. No. 104,343, now Patent No. 3,673,140. Divided and this application Apr. 14, 1972, Ser. No. 244,219

Int. Cl. B44d 1/50

U.S. Cl. 117—38 **8 Claims**

Printing ink compositions preferably comprising epoxidized soybean oil acrylate or certain derivatives thereof and a radiation sensitizer having a triplet energy between about 42 and 85 kcal./mole. Also, the method of printing with such inks comprising exposing the inks to an amount of actinic radiation effective to polymerize the inks to a non-offsetting state and the printed substrate produced by this method.

Novel alkyd-derived compositions used as vehicles for the above printing ink compositions and preferably comprising the reaction product of

(1) an alkyd formed from trimethylol propane, tall oil fatty acid, and adipic acid with
(2) the reaction product of toluene diisocyanate and the monoacrylic acid ester of ethylene glycol.

The method of coating with such compositions comprising exposing them, in combination with a radiation sensitizer, to an amount of radiation effective to polymerize them to a non-offsetting state.

3,713,865

COMPOSITE PRODUCT AND METHOD OF MAKING SAME

Donald H. Leeds, Rolling Hills, Calif., assignor to Ducommun Incorporated, Los Angeles, Calif.

Filed July 5, 1968, Ser. No. 742,543

Int. Cl. C23c 11/08; B44d 1/02

U.S. Cl. 117—46 CC **40 Claims**

A composite product and method of producing same having a substrate or matrix comprising carbonized fibers in which a metallic salt solution consisting of a soluble metal salt selected from a group consisting of Hf, Zr, Ta, Cb, W, Mo, Ti, V, Cr, Si, B, P and Pb, which form either carbides which are refractory or oxides which melt and are capable of forming a liquid surface (which will slow the diffusion of oxygen to the graphite surface causing either $C + 1/2O_2$ CO or $C + O_2$ CO_2, depending upon the pressure and temperatures used in the end use). Said metallic salt when dissolved in a solvent of water or a solvent containing acetone, alcohol, ether or the like, is introduced into the interstices of the substrate and which after drying is left in fine particles. The composite is then heated to a temperature in the range of 1,500° to 2,500° F. with or without hydrogen atmosphere to effect partial reduction of the metallic salt. Almost simultaneously, carbon is infiltrated into the substrate to enclose the fibers and the metal particles. Subsequently the substrate is raised to a temperature of between approximately 1,400° C. and approximately 2,800° C. to anneal the pyrocarbon and convert the reduced metallic salt into carbide, thus producing a composition product having the substrate fibers surrounded by dead soft annealed graphite intimately mixed with hard carbide particles of very high melting point. The metal salt impregnated matrix, the reduced and/or not pyrocarbon coated metal salt in the matrix and the reduced, pyrocarbon coated, carbide converted metal salt or oxidized variations thereof are all referred to hereafter as alloys of the matrix.

3,713,866

METHOD OF AND APPARATUS FOR APPLYING AN ANTICORROSION COATING TO A HOT-FORMED METAL BODY

Georges Schaumburg, 1 bis, rue de Londres, Montigny-les-Metz, France

Filed June 23, 1969, Ser. No. 836,224

Claims priority, application Germany, June 25, 1968, P 17 71 677.7

Int. Cl. B44d 1/34; C23f 15/00

U.S. Cl. 117—50 **5 Claims**

A hot-formed metal body emerges from a hot-forming stage in a solid, relatively scale-free, and hot condition and passes immediately into a treatment chamber prior to any substantial scale formation thereon. In this chamber a powder is sprayed on the body which, on cooling, forms a glassy, enamel-like coating on the body. After thorough cooling of the body, the

coating is stripped off in a straightening apparatus and the body is recoated with a protective, relatively-long-lived coating or retains a coating, e.g., of zinc, applied with the temporary enamel coating.

3,713,867
METHOD OF COATING GLASS CONTAINERS AND THE LIKE
Dean B. Parkinson, Redwood City, and Arthur G. Brown, Menlo Park, Calif., assignors to Glass Containers Corporation, Fullerton, Calif.
No Drawing. Filed Mar. 24, 1969, Ser. No. 809,999
Int. Cl. C03c *17/32*
U.S. Cl. 117—54 15 Claims

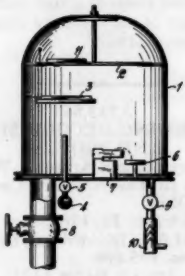
Hot glass is coated, as by spraying, with a monomer, or prepolymer system which contains no volatile solvent or diluent (except one which reacts with the system and does not volatilize) and which under the conditions of application (contact as a film with a hot glass surface) will polymerize to a hard, adherent coating. Ceramic materials may be similarly coated.

3,713,868
ACRYLIC-NITRILE FOAM-BACKED FABRIC AND METHOD OF PREPARATION
Philip L. Gordon, and Augustin La Torre, both of Cambridge, Mass., assignors to General Latex and Chemical Corporation, Cambridge, Mass.
Continuation-in-part of Ser. No. 72,819, Sept. 16, 1970, which is a continuation-in-part of Ser. No. 683,828, Nov. 17, 1967, abandoned. This application Jan. 6, 1971, Ser. No. 104,479
Int. Cl. B44d *1/44*
U.S. Cl. 117—65.2 31 Claims

An acrylic foam-coated fabric which is breathable, opaque, has excellent insulation properties and is resistant to water and dry-cleaning solvents, but which is flexible and has good hand and drape properties. The fabric has a densified foam coating of a cured acrylic-nitrile copolymer which contains an opaque filler material. The coated fabric is prepared by coating a fabric with an air-froth latex cross-linkable acrylic-nitrile polymer composition, drying the foam coating to a semirigid state, calendering the semirigid foam coating to crush and densify the coating; and thereafter, curing the densified foam coating. The fabric finds particular use for drapery material and surface coverings, such as upholstery fabric and clothing like rainwear and inserts.

3,713,869
METHOD OF APPLYING HARD INORGANIC LAYERS TO PLASTICS
Walter Geffcken; Volker Raquet, both of Mainz; Helmut Dislich, Budenheim; Hubert Dutz, Mainz, and Hans-Otto Mulfinger, Ingelheim, all of Germany, assignors to JENAer Glaswerk Schott & Gen., Mainz, Germany
Filed June 9, 1971, Ser. No. 151,427
Int. Cl. B44d *1/14*
U.S. Cl. 117—70 A 7 Claims

For the purpose of improving the adherence of a hard inorganic layer which is vaporized in vacuum and precipitated on a substratum of a plastic, an intermediate layer is disposed between the inorganic layer and the substratum. This intermediate layer comprises a polymerization layer which is produced by a glow discharge in a low-molecular organic vapor and is precipitated on said substratum. The substratum may comprise, for example, diethylene-glycol-diallyl-carbonate (CR39), polycarbonate or polymethylmetacrylate (PMMA), while as organic substances for the intermediate layer may be used, for example, silicic-acid-methyl, silicic-



acid-ethylester, low boiling siloxane and silicon oils. These organic substances are particularly suitable when a glass layer is used as inorganic layer.

3,713,870
METHOD OF DEPOSITING METALLIC FLAKES
Melvin S. Kaye, Short Hills, N.J., assignor to Maas & Waldstein Co.
Continuation-in-part of Ser. No. 664,609, Aug. 31, 1967, abandoned. This application March 6, 1970, Ser. No. 17,346
Int. Cl. B44d *1/06, 1/14, 1/02*
U.S. Cl. 117—71 R 10 Claims

The present invention is directed to a method whereby thin metal flakes are deposited on a solid substrate or base. The method consists essentially in providing flakes which are very thin and relatively small and suspending them in a volatile organic liquid. The substrate is then brought into contact with the suspension in order to form a film which contains a certain number of flakes. When the substrate is removed from the suspension and the liquid is allowed to evaporate, the flakes attach themselves to the substrate by inter-molecular attraction.

3,713,871
COATED GLASS FIBER STRANDS
Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation
No Drawing. Continuation of application Ser. No. 816,151, Apr. 1, 1969, which is a continuation of application Ser. No. 544,104, Apr. 21, 1966, both now abandoned. This application Nov. 30, 1970, Ser. No. 93,906
Int. Cl. C03c *25/02*
U.S. Cl. 117—72 10 Claims

Glass fiber strand carrying a plurality of continuous coatings, at least one adjacent a strand containing a hardened material, and at least the outer coating being a base organosol or a base plastisol and method for producing such coated strand.

3,713,872
METHOD OF SPRAYING THERMOPLASTIC PAINT COMPOSITIONS
Samuel Porter, Jr., Tarentum; Donald P. Hart, Allison Park, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Feb. 1, 1971, Ser. No. 111,754
Int. Cl. B44d *1/08*
U.S. Cl. 117—75 12 Claims

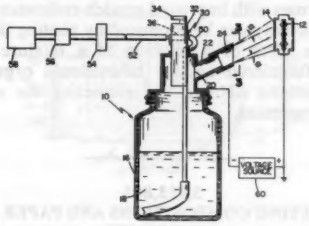
A coating composition comprising a thermoplastic acrylic polymer in a solution wherein the polymeric solution, devoid of pigment, has a surface tension of less than 25.2 dynes per centimeter at room temperature is particularly useful as an automotive top coating. The coating compositions, when sprayed onto substrates, exhibit increased efficiency of paint deposited per unit of paint sprayed.

3,713,873

ELECTROSTATIC SPRAY COATING METHODS

Frank Hamilton Fish, Westwood, Mass., assignor to The Gillette Company, Boston, Mass.

Division of Ser. No. 786,318, Dec. 23, 1968, Pat. No. 3,589,606. This application Nov. 18, 1970, Ser. No. 90,746
Int. Cl. B05t *5/02*
U.S. Cl. 117—93.4 R 12 Claims



A method of electrostatic spray coating an article includes the steps of establishing an electrostatic field having an average gradient less than 10 kilovolts per centimeter between a mist generator and the article to be coated; and maintaining a quiescent zone in the atmosphere adjacent the article to be coated, the distance of the article from the output of the mist generator being sufficient to permit substantial dispersion of the spray particles. Particles of less than 10 microns in size are continuously generated and they are accelerated under the influence of the electrostatic field for deposit on the surface to be coated. The electrostatic field carries the particles through the quiescent atmosphere so that a substantial portion of the mist particles which would not otherwise have been deposited on the article and liquid are deposited on the article. Relative movement between the mist generator and the article surface transverse to the general direction of mist particle movement during particle deposition is continuous.

3,713,874

PHOTOPOLYMERIZED POLYCARBOXYLIC ACID ANHYDRIDE FILM COATING AND PRODUCT, AND METHOD OF FORMING

Archibald N. Wright, Schenectady, N.Y., and Wilfred F. Mathewson, Jr., Franklin, Mich., assignors to General Electric Company

Original application Mar. 14, 1967, Ser. No. 622,944, now Patent No. 3,578,425. Divided and this application Dec. 15, 1970, Ser. No. 98,434
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 10 Claims

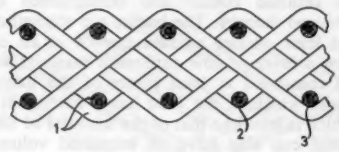
A thin, continuous film is formed on a substrate by ultraviolet surface photopolymerization of a material in the gaseous phase. The material is selected from various anhydrides and dianhydrides. Such films, which can be selectively formed as electrically insulating or electrically conductive, are useful as coatings on metallic and nonmetallic substrates, and for corrosion protection. The electrically insulating films are useful further as capacitor dielectrics, cryogenic device insulation, insulation for microelectric devices, and primer or insulation on electrically conductive wire, while the electrically conductive films can also be employed as conductive layers in microelectric devices.

3,713,875

FILTER- AND SCREEN CLOTHS MADE FROM COATED POLYESTER MATERIAL

Gerhard Beyer, Hofheim, Taunus, and Hermann Nagelsmann, Schwalbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed May 1, 1970, Ser. No. 33,746
Claims priority, application Germany, May 5, 1969, G 69 18 165.3
Int. Cl. B44d *1/02*
U.S. Cl. 117—98 6 Claims



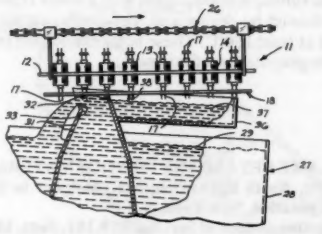
The present invention relates to filter- and screen cloths made from polyester yarns, polyester cord yarns or polyester monofils which have been coated with a thermoplastic material being resistant to hydrolysis and melting at a temperature above 130° C. The polyester yarns, -cord yarns or -monofils consisting, for example, of polyethylene terephthalate; the coating may consist, for example, of polyethylene, polypropylene or poly-(4-methylpentene-1).

3,713,876

METHODS OF METAL COATING ARTICLES

Drago Lavric, Columbus, Ohio, assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed April 7, 1970, Ser. No. 26,220
Int. Cl. B23k *1/08*; C23c *1/04*; H05k *3/34*
U.S. Cl. 117—102 M 6 Claims



Selected areas of articles to be joined by the application of solder to the areas is accomplished by moving the articles in a selected path over a wave of molten solder. Portions of the molten solder adheres to and solidifies subsequently around the selected areas so that the areas of the articles are joined thereby. As the selected areas are moved away from the wave of molten solder, portions of the solder, which adhere to the selected areas of the articles, tend to flow downwardly from the selected areas by gravity and would normally solidify and thereby form solder icicles. However, the articles being joined are passed over a heated solder bath immediately after passing over the wave of molten solder in such proximity that as the solder icicles tend to form, the lowermost portions of the icicles engage the heated solder bath and remain in a flowable state whereby the excess solder which is tending to form the icicles is drawn by adhesion into the heated solder bath.

3,713,877

METHOD OF STRENGTHENING CERAMIC BODIES AND STRENGTHENED CERAMIC BODIES PRODUCED THEREBY

Henry P. Kirchner, State College, Ralph E. Walker, Julian, and Robert M. Gruver, State College, Pa., assignors to Henry P. Kirchner, Borough of State College, Pa.

Continuation-in-part of application Ser. No. 475,450, July 28, 1965. This application Feb. 10, 1969, Ser. No. 813,788

Int. Cl. C04b *35/02*

U.S. Cl. 117—123 A 49 Claims

A method of increasing the bending strength and thermal shock characteristics of single crystal and polycrystalline ceramic bodies and strengthened ceramic bodies produced thereby. The bodies are strengthened by forming at least on one surface thereof at an elevated temperature a layer of low expansion material which is a material composed at least partly of the material of the body and which at the least has a coefficient of expansion which is less than that of the material of the body. The material can also have an increased volume, and can be a solid solution or the material of the body in a changed phase. The body is then cooled so as to produce on the surface of the body a layer which is under compression relative to the body.

3,713,878

TEXTILE FINISHING PROCESS AND PRODUCT PRODUCED THEREBY

Manuel A. Thomas, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Nov. 16, 1970, Ser. No. 90,108

Int. Cl. C09d *5/00*

U.S. Cl. 117—135.5 12 Claims

This disclosure describes a process for producing vapor transmissible polymer coated textile fabrics, and, in addition, vapor transmissible water resistant fabrics. The vapor transmissible textile fabrics are prepared by applying to the fabric a composition comprising a polymer compound having particular film stiffening temperatures and a wax, and thereafter heating the fabric and the composition to a temperature of at least about 150°C. to volatilize some of the wax. The preparation of the vapor transmissible water resistant fabrics involves an additional and subsequent treatment with a water repellent composition followed by drying and, optionally, curing at a temperature of at least 150°C. These latter fabrics are particularly useful in the preparation of rainwear.

3,713,879

FLAME RETARDANT FIBROUS MATERIAL

Chisung Wu, North Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 859,181, Sept. 18, 1969, abandoned. This application May 18, 1970, Ser. No. 38,585

Int. Cl. C09k *3/28*; D06m *13/28, 13/40*

U.S. Cl. 117—136 20 Claims

A fibrous material containing a flame retardant amount of the product produced by reacting (a) elemental phosphorus, (b) ethylene oxide, propylene oxide, 1,2-butylene oxide, or 1,2-epoxytetradecane and (c) an alcohol selected from the group consisting of propylene glycol, methanol, ethanol, propanol, butanol, dodecanol, and N,N-dimethylethanolamine; in the presence of a base catalyst selected from the group consisting of alkali metal alkoxide and a quaternary ammonium compound formed by interaction of reactant (b) and an N,N-dimethylamine; to produce an organophosphorus composition, and thereafter reacting said organophosphorus composition, with formaldehyde in proportions, at a temperature, and for a period of time sufficient to convert substantially all phosphinous hydrogen in said organophosphorus composition to hydroxymethyl groups.

3,713,880

PROCESS FOR THE MODIFICATION OF THE SURFACE PROPERTIES OF MOULDINGS MADE OF TRANSPARENT THERMOPLASTIC SYNTHETIC RESINS

Ulrich Krekeler, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,974

Claims priority, application Germany, Dec. 12, 1969, P 19 62 354.2

Int. Cl. B44d *1/22*

U.S. Cl. 117—138.8 B 4 Claims

Mouldings made of transparent synthetic resins, such as optical lenses with improved scratch-resistance and electrical conductivity can be produced by coating the mouldings with a layer of a solution of a mixture of alkyl silicate, trifunctional and/or bifunctional organosilanes and an antistatic additive and subjecting the mouldings to a heat treatment.

3,713,881

PAPER COATING COMPOSITIONS AND PAPER COATED THEREWITH

Toyomi Akiyama, Sakai, Osaka; Mitsuru Kondo, Hyogo, and Satoshi Dotani, Toyonaka, Osaka, all of Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed Sept. 2, 1969, Ser. No. 854,767

Claims priority, application Japan, Sept. 2, 1968, 43/62891

Int. Cl. D21h *1/32*

U.S. Cl. 117—155 UA 3 Claims

An aqueous pigment coating composition essentially containing water-soluble modified polyvinyl alcohol as a coating binder having one kind or plural different kinds of substituent group selected from cyanoethyl group, carbamoylethyl group, carboxyethyl group, sodium carboxyethyl group, potassium carboxyethyl group, ammonium carboxyethyl group, carboxymethyl group, sodium carboxymethyl group, potassium carboxymethyl group and ammonium carboxymethyl group. The coating color has a proper flow property and provides a pattern-free and smooth surface onto a coated paper.

3,713,882

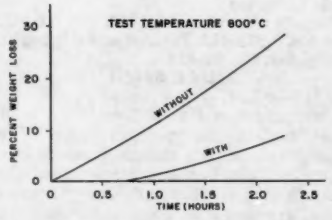
METHOD OF PROTECTING CARBONACEOUS MATERIAL FROM OXIDATION AT HIGH TEMPERATURE

Ralph E. DeBrunner, 4717 Connel Dr., Raleigh, and Patricia C. Clements, 1000 N. Duke St., Durham, both of N.C.

Filed March 5, 1971, Ser. No. 121,451

Int. Cl. B44d *1/20*

U.S. Cl. 117—169 R 2 Claims

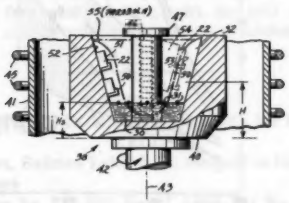


Oxidation resistance is imparted to all-carbon bodies by applying a phosphoric acid solution of manganese pyrophosphate thereto and heating the coated body to a temperature of 500° C or greater for approximately 5–10 minutes.

3,713,883
METHOD OF AND APPARATUS FOR GROWING CRYSTALS FROM A SOLUTION

Suei-Yuen Paul Lien, Morrisville, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed May 27, 1970, Ser. No. 40,854
Int. Cl. H01l 7/32
U.S. Cl. 117—201 63 Claims

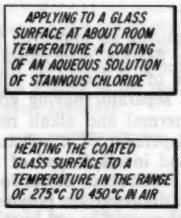


A mixture (liquid or solid), including a solvent, a solute (comprising the constituents of a crystal to be grown), and any desired dopant, is placed in a drum rotatable on a major (and preferably generally vertical) axis. Substrates are mounted in the drum above the mixture level. The mixture is heated to dissolve the solute and form a solution. The solution is moved over and covers the substrates via a centrifugally induced forced vortex by rotating the drum. The system is controllably cooled, or otherwise affected, to effect crystal growth on the substrate. Expedients are provided to accomodate substrates both denser than and less dense than the solution and to obviate undesirable effects of contaminants in the solution. Defects in the grown crystals caused by temperature gradients, solution concentration gradients and turbulence are also obviated by appropriate facilities.

3,713,884
METHOD FOR PREPARING A CONDUCTIVE COATING ON A GLASS SURFACE

James John Maley, Lancaster, Pa., assignor to RCA Corporation

Filed Sept. 25, 1970, Ser. No. 75,552
Int. Cl. H01j 29/28; B44d 1/18
U.S. Cl. 117—211 4 Claims

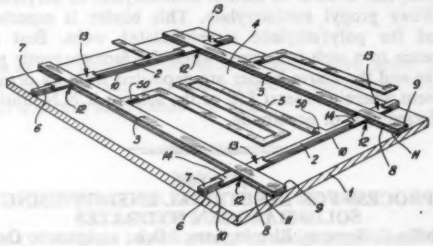

APPLYING TO A GLASS SURFACE AT ABOUT ROOM TEMPERATURE A COATING OF AN AQUEOUS SOLUTION OF STANNOUS CHLORIDE
HEATING THE COATED GLASS SURFACE TO A TEMPERATURE IN THE RANGE OF 275°C TO 450°C IN AIR

Method includes applying to a glass surface, such as the inner surface of an electron-tube glass envelope, at room temperature a coating of an aqueous stannous chloride solution and heating the coated glass in an air atmosphere to a temperature in the range of 275° to 450°C.

3,713,885
MEMORY MATRIX AND ITS PROCESS OF FABRICATION

Pierre Arthur Betremieux; Henri Gerard Feissel; Jean Hilaire Gallard, and Isidore Lagadec, all of Parris, France, assignors to Societe Industrielle Honeywell Bull, Paris, France

Filed March 2, 1970, Ser. No. 15,651
Claims priority, application France, March 6, 1969, 6906298
Int. Cl. B44d 1/00
U.S. Cl. 117—212 8 Claims

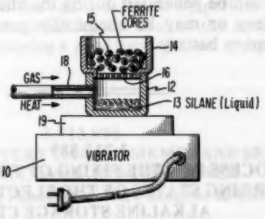


A memory matrix and the process for fabricating said matrix, wherein a conductive array is formed of two mutually orthogonal and insulated sets of parallel conductive metallic bands, each band being formed of two superposed conductive strips, the lower strip of each band of the first set passing through an opening in the lower strip of each band of the second set and the upper strip of each band of the second set passing through an opening in the upper strip of each band of the first set, and wherein coupling elements selectively couple bands of one set to bands of the other set.

3,713,886
ENCAPSULATED MAGNETIC MEMORY ELEMENT

Thomas Phillip Fulton, Brookline, and Henry Di Luca, Waltham, both of Mass., assignors to RCA Corporation

Division of Ser. No. 825,297, May 16, 1969, Pat. No. 3,640,767. This application Jan. 15, 1971, Ser. No. 106,914
Int. Cl. H01f 1/22
U.S. Cl. 117—234 1 Claim



Encapsulated ferrite magnetic memory cores are disclosed which have a very thin coating of polymerized gamma-aminopropyltriethoxysilane, whereby the cores are organophilic for adhesion to an uncured silicone rubber-coated substrate, are lubricated to minimize friction with wires passed through the holes in the cores, and are hydrophobic to provide moisture repellency of the cores in use in a memory. The cores are encapsulated by shaking a substantial bulk quantity of sintered ferrite memory cores in silane vapor at a temperature of about 220°C in an inert gaseous environment having a known moisture content.

3,713,887

MAGNETIC RECORDING MEMBER WITH BINDER THEREFOR

Ronald M. Stimson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 1, 1970, Ser. No. 33,969
Int. Cl. G03c *1/80, 1/84;* G11b *5/62*
U.S. Cl. 117—235 **3 Claims**

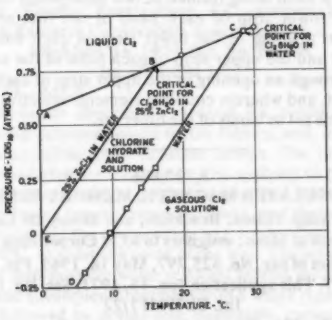
A magnetic recording member such as tape or striped motion picture film wherein a layer of ferromagnetic particles is bound on a synthetic resin web by a binder consisting essentially of cellulose nitrate in intimate mixture with a polymeric composition consisting essentially of, by weight, 50–80% vinylidene chloride, 2–30% acrylonitrile, and 0–60% of methyl methacrylate or acrylate or hydroxy propyl methacrylate. This binder is especially good for poly(ethylene terephthalate) webs. Best adherence to a web is secured when the ferromagnetic particles and the above binder are deposited from an organic solvent wherein at least 8% of the solvent is N,N-dimethyl formamide or acetamide.

3,713,888

PROCESS FOR ELECTRICAL ENERGY USING SOLID HALOGEN HYDRATES

Philip C. Symons, Birmingham, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

Filed June 26, 1970, Ser. No. 50,054
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 **19 Claims**


LIQUID Cl2
CRITICAL POINT FOR Cl2.8H2O IN WATER
CRITICAL POINT FOR Cl2.8H2O IN 25% ZnCl2
CHLORINE HYDRATE AND SOLUTION
GASEOUS Cl2 + SOLUTION
PRESSURE - LOG10 (ATM'S)
TEMPERATURE - °C.

A process for the useful storage of electrical energy employing halogen hydrates is described. The halogen hydrate can be generated during the charging of a secondary battery or may be chemically generated and placed in a primary battery.

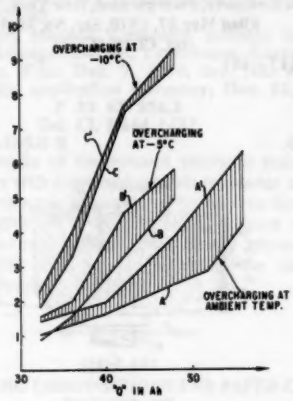
3,713,889

PROCESS FOR THE FIXING OF THE RELATIVE CHARGING STATES OF THE ELECTRODES OF AN ALKALINE STORAGE CELL

Yves Jacques Felix Lecouffe, Paris, France, assignor to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme), Romainville, France

Filed Nov. 26, 1971, Ser. No. 202,308
Claims priority, application France, Nov. 30, 1970, 7043008
Int. Cl. H01m *35/00*
U.S. Cl. 136—6 **6 Claims**

Process for fixing the relative charging states of electrodes of an alkaline storage cell having thin electrodes of less than 1 mm thickness separated by a narrow gap that is less than or equal to 0.3 mm and in which the negative electrode has a higher capacity than the positive electrode. The storage cell in open state with electrolyte therein after complete charging of the positive electrode is given an overcharge at a temperature below 0°C. and a low as −5° or −10°C. so that the charged capacity of the negative electrode is higher than that of the positive electrode but has a selected predetermined excess value less, however, than the maximum capacity to which it may be charged in the storage cell.

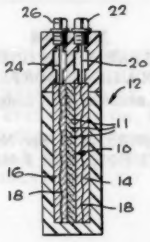


3,713,890

FLEXIBLE BATTERY SEPARATOR AND METHOD OF PRODUCTION

Murray P. Strier, Niagara Falls, N.Y., and Joseph S. Smatko, Santa Barbara, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Continuation-in-part of application Ser. No. 6,409, Jan. 28, 1970. This application Apr. 13, 1970, Ser. No. 27,577
Int. Cl. H01m *3/02*
U.S. Cl. 136—20 **27 Claims**



Method for producing an improved battery separator, in the form of a flexible microporous separator film containing particles of an inorganic substance in an organic binder, such separator having good ionic conductivity and good thermal and alkali resistance, by mixing an aqueous dispersion of a substance which is insoluble in water and in alkali and of fine particle size, e.g. zirconia, with an aqueous dispersion of a latex type polymer such as a fluorocarbon polymer, e.g. polytetrafluoroethylene, casting a film of such mixture, drying the film, sintering the dried film, and forming a film of said polymer with particles of such substance, e.g. zirconia, uniformly distributed in such film, and preferably including treating such sintered film with alkali, preferably aqueous KOH, to substantially increase the conductivity of such film. The resulting flexible separator film produced by such process.

3,713,891

CHLORIDE FREE LEACHING PROCESS FOR POROUS ZINC ANODES

Edward J. Curelop, Brockton, and Nikola Marincic, Winchester, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Feb. 10, 1971, Ser. No. 114,349
Int. Cl. H01m 43/02
U.S. Cl. 136—30 4 Claims

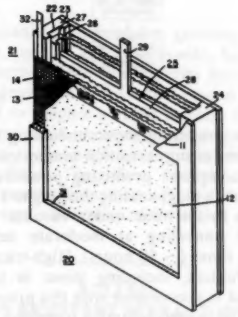
A porous zinc anode produced and adapted for use in alkaline solution, said anode in said solution constituting means for obviating gassing characteristics as contrasted to a porous zinc anode produced in other ways. The essential step in the invention is free acid leaching with an acid other than hydrochloric acid in order to form a water soluble salt of the free acid.

3,713,892

METHOD OF CHARGING SECONDARY METAL-AIR CELL

Paul J. Moran, Ballston Lake, N.Y., assignor to General Electric Company

Division of Ser. No. 772,585, Nov. 1, 1968, Pat. No. 3,592,695.
This application June 28, 1971, Ser. No. 157,655
Int. Cl. H01m 29/04
U.S. Cl. 136—86 A 1 Claim



A composite gas diffusion electrode has an electrically conductive porous substrate, non-noble metal catalytic material impregnated into the substrate, at least one chemically inert porous separator positioned adjacent one surface of the catalytically impregnated substrate, and a porous, electrically conductive sheet positioned adjacent the opposite surface of the separator and in electrical contact with the substrate, the porous sheet having a lower oxygen overvoltage than the substrate. During the charging of a cell employing the above electrode, the porous sheet provides isolation of oxygen gassing at the porous sheet while the porous separator provides physical spacing of the oxygen gassing at the porous sheet from the catalytically impregnated substrate.

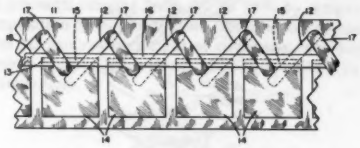
3,713,893

INTEGRATED SOLAR CELL ARRAY

Fred A. Shirland, Lakewood, Ohio, assignor to Gould Inc., Chicago, Ill.

Original application Feb. 17, 1967, Ser. No. 616,885. Divided and this application Nov. 20, 1969, Ser. No. 877,546
Int. Cl. H01l 15/02
U.S. Cl. 136—89 6 Claims

An integral battery of serially connected photovoltaic cells on a single insulating substrate. Metalized areas are formed on the substrate with semi-conductive film such as cadmium sulfide vacuum evaporated upon each of the metalized areas. Barrier layers are formed on the cadmium sulfide films to produce PN junctions. Electrode



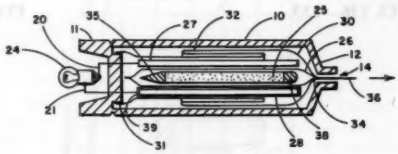
leads extend parallel from each metalized area under the semi-conductor film to a top surface of the barrier layer of an adjacent semi-conductor film.

3,713,894

DISPOSABLE RESERVE ACTIVATED ELECTROCHEMICAL CELL

Evert C. Weidner, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 30, 1971, Ser. No. 175,825
Int. Cl. H01m 21/00
U.S. Cl. 136—113 5 Claims



A disposable reserve activated electrochemical cell wherein the active elements of the cell, including electrolyte solvent, are maintained in a separate first flexible plastic envelope and the entire cell, including the first envelope, are contained within a second flexible plastic envelope. Both the first and the second envelope are contained within a relatively rigid housing. The activation of the cell is achieved by perforating the first envelope, without breaking the seal of the second envelope, thereby maintaining a good hermetic seal and preventing leakage.

3,713,895

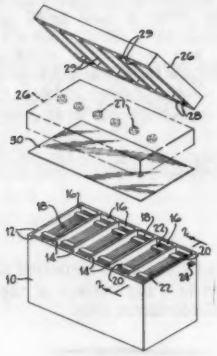
MULTICELL BATTERY HAVING MEMBRANE SEALED BETWEEN COVER AND CONTAINER

James W. Consolloy, Pennington, N.J., assignor to ESB Incorporated

Continuation of Ser. No. 885,856, Dec. 17, 1969, abandoned.
This application June 29, 1971, Ser. No. 157,847
Int. Cl. H01m 21/10
U.S. Cl. 136—114 8 Claims

A membrane extends between and is sealed to the mating exterior and interior surfaces of the container and cover of a multicell battery to provide a liquid-tight seal across the top of each cell compartment inside the battery. The space above the membrane in each of the cell compartments may be used as an electrolyte storage compartment in a battery having dry, charged electrodes. With or without the spaces above the membrane being used to store electrolyte in each cell compartment, the membrane may be used to seal and thus main-

tain the factory dryness of dry, charged electrodes. As another alternative, the membrane can be used with a "wet" battery



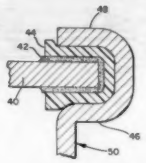
(one having electrolyte in contact with the electrodes when shipped from the factory) to prevent spilling or leaking of electrolyte during battery shipment or storage.

3,713,896

SEAL FOR ELECTROCHEMICAL CELLS

Ralph H. Feldhake, Verona, Wis., assignor to ESB Incorporated

Filed Aug. 19, 1970, Ser. No. 65,113
Int. Cl. H01m *1/02*
U.S. Cl. 136—133 **17 Claims**



An insulating seal between metallic battery parts based upon the use of an epoxy-polyamide resin is described. In a first embodiment of the invention, a coating of cured resin on one of the metallic parts forms the seal. In a second embodiment, the seal comprises a coating of epoxy-polyamide resin and a grommet of a selected polymer compressed between the two metal parts. In a third embodiment, a nylon grommet is injection molded over a metallic member having a coating of epoxy-polyamide. In a fourth embodiment, a metallic member having a nickel surface is treated with carbon. The carbonized surface is coated with epoxy-polyamide and a seal is then made according to any of the first three embodiments. In a final series of embodiments, the coatings and other treatments described are applied to both metallic surfaces.

3,713,897

ELECTROLYTE MATERIALS FOR HIGH VOLTAGE SOLID ELECTROLYTE BATTERY SYSTEMS

Charles C. Liang, Andover, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Oct. 15, 1970, Ser. No. 81,083
Int. Cl. H01m *11/00*
U.S. Cl. 136—153 **27 Claims**

A solid electrolyte material containing lithium iodide, lithium hydroxide, and aluminum oxide, suitable for use in high voltage solid electrolyte systems, is a pure ionic conductor, with a conductivity of about 1×10^{-5} ohm^{-1} cm.$^{-1}$.

ERRATUM

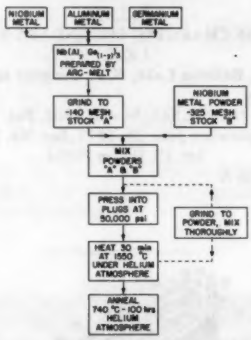
For Clas 136—233 see:
Patent No. 3,713,899

3,713,898

PROCESS FOR PREPARING HIGH-TRANSITION-TEMPERATURE SUPERCONDUCTORS IN THE NB-AL-GE SYSTEM

Angelo L. Giorgi, and Eugene G. Szklarz, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed April 26, 1971, Ser. No. 137,498
Int. Cl. C21d *1/00*
U.S. Cl. 148—126 **17 Claims**


NIOBIUM METAL
ALUMINUM METAL
GERMANIUM METAL
PREPARED BY ARC-MELT
GRIND TO -140 MESH STOCK "A"
NIOBIUM METAL POWDER -325 MESH STOCK "B"
MIX POWDERS "A" & "B"
PRESS INTO PLUGS AT 50,000 psi
GRIND TO POWDER, MIX THOROUGHLY
HEAT 30 min AT 1550 °C UNDER HELIUM ATMOSPHERE
ANNEAL 740 °C - 100 hrs HELIUM ATMOSPHERE

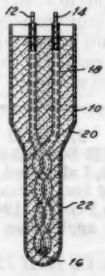
A process for preparing superconducting materials in the Nb-Al-Ge system having transition temperatures in excess of 19° K. which comprises premixing powdered constituents, pressing them into a plug, heating the plug to 1,450°-1,800° C. for 30 minutes to an hour under vacuum or an inert atmosphere, and annealing at moderate temperatures for reasonably long times (~ 50 hours). High-transition-temperature superconductors, including those in the $Nb_3(Al,Ge)$ system, prepared in accordance with this process exhibit little degradation in the superconducting transition temperature on being ground to −200 mesh powder.

3,713,899

THERMOCOUPLE PROBE

Thomas M. Sebestyen, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 12, 1970, Ser. No. 88,774
Int. Cl. H01v *1/02*
U.S. Cl. 136—233 **9 Claims**



Sheaths of thermally unstable material are applied to the portions of the thermocouple wires adjacent the thermocou-

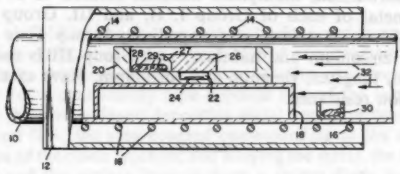
ple junction. The sheathed wires are embedded in encapsulating material and then exposed to a temperature sufficient to degrade the sheath material in a manner that reduces its volume. Subsequent thermal expansion and contraction of the conductors takes place without mechanical stressing in the resulting open spaces surrounding each conductor.

3,713,900

METHOD FOR MAKING UNIFORM SINGLE CRYSTAL SEMICONDUCTORS EPITAXIALLY

Clarence K. Suzuki, 10091 Theseus Drive, Huntington Beach, Calif.

Filed April 2, 1969, Ser. No. 812,684
Int. Cl. H01l 7/38; B01j 17/20
U.S. Cl. 148—1.5 **7 Claims**



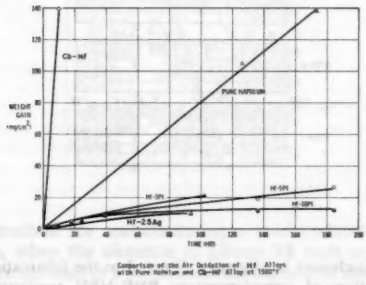
A liquid epitaxial method for growing single crystal semiconductors, such as gallium arsenide, having a substantially uniform three-dimensional impurity distribution. A melt of the epitaxial growth material is first caused to etch the surface of the seed to prepare a virgin surface. Epitaxial formation then involves rapid nucleation of the semiconductor on the virgin surface so that nucleation occurs uniformly over the entire seed surface. Thereafter, formation of the bulk semiconductor proceeds isothermally by vapor-liquid-solid deposition to insure uniformity of formation of the semiconductor.

3,713,901

OXIDATION RESISTANT REFRACTORY ALLOYS

Jack L. Blumenthal, Los Angeles; John R. Ogren, La Palma, and Marvin Appel, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed April 20, 1970, Ser. No. 29,893
Int. Cl. C23c 17/00
U.S. Cl. 148—6.3 **16 Claims**



Comparison of the Air Oxidation of Hf Alloys with Pure Hafnium and Cb—Hf Alloy at 1500°F

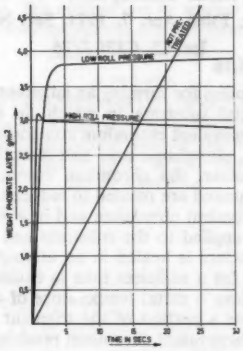
This invention relates to high-temperature, oxidation-resistant refractory materials or alloys and to a method of preparing said alloys which have an outer skin containing at least one noble metal, e.g., platinum, and/or silver, in amounts greater than the amount of noble metal present in the alloy beneath said skin. The alloy comprises at least one noble metal selected from the group consisting of platinum, gold, silver, rhodium, iridium and palladium. The noble metal is added in amounts ranging from 0.1 to 15% by weight of the total composition to hafnium or to hafnium containing from about 0 to 50 percent by weight of zirconium, and heated to temperatures ranging from about 1000°F to 3800°F in an oxidizing atmosphere.

3,713,902

PROCESS FOR MANUFACTURING ZINC COATED STEEL SHEET, AND STEEL SHEET OBTAINED BY THIS PROCESS

Hans Gerhard Vrijburg, Heemskerk, and Cornelis Leendert Bijl, Velsen-Zuid, both of Netherlands, assignors to Koninklijke Nederlandsche Hoogovens En Staalfabrieken N.V.

Filed June 16, 1970, Ser. No. 46,774
Claims priority, application Netherlands, June 18, 1969, 6909307
Int. Cl. C23f 7/12
U.S. Cl. 148—6.15 Z **7 Claims**



Phosphated zinc coated steel sheet characterized by a phosphate layer with a mass of less than 4 g/m² and with a structure which closes the zinc layer 90 percent or more, and process for improving phosphating of zinc coated steel sheet which essentially comprises passing the zinc coated sheet between elastically surfaced rollers prior to phosphating.

3,713,903

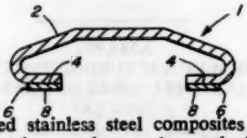
TRIM MEMBERS AND PRODUCTION THEREOF

Donald R. Zaremski, Cheswick, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Original application Sept. 24, 1969, Ser. No. 860,541. Divided and this application Feb. 16, 1971, Ser. No. 115,363
Int. Cl. C23f 7/14, 7/26
U.S. Cl. 148—6.15 R **4 Claims**

The application describes assemblies comprised of a body member in combination with a stainless steel trim member having a contact surface which abuts the body member and an exposure surface subject to view. Adhered to the contact surface and located between the contact surface and the body member is a layer of aluminum which provides galvanic protection for the body member. Covering the aluminum is a chromate or phosphate con-

version coating which provides protection against aluminum galvanic corrosion without detrimentally affecting the galvanic protection which aluminum provides for the body member. Also described are conversion-coated,



aluminum-striped stainless steel composites suitable for fabrication into trim members and a method for producing conversion-coated, aluminum-striped stainless steel trim members.

3,713,904

COMPOSITION AND METHOD FOR PRODUCING CORROSION RESISTANT AND PROTECTIVE COATINGS ON ALUMINUM AND ALUMINUM ALLOYS

Kornel Bernath, Cucumonga, S. Neil Moffett, Colton, and Pandelis N. Papafingos, Riverside, Calif., assignors to American Metal Climax, Inc., New York, N.Y.

No Drawing. Filed Apr. 7, 1971, Ser. No. 132,211

Int. Cl. C23f 7/26

U.S. Cl. 148—6.16 6 Claims

A coating process for forming an adherent organic resin coating on metal substrate in which an organic resin, an inorganic hexavalent chromium compound, an oxidizable component, phosphoric acid and strontium chromate are mixed together, the chromium compound and the oxidizable compound are reacted to reduce the hexavalent chromium to trivalent chromium and in which the resulting mixture is applied to the substrate and the substrate and applied mixture is heated in an atmosphere of from 600 to 800° F. for a sufficient time in excess of about 26 seconds to achieve a metal temperature of at least about 450° F. to cause a portion of the trivalent chromium to be oxidized to hexavalent chromium resulting in a strongly adherent organic resin coating is described.

3,713,905

DEEP AIR-HARDENED ALLOY STEEL ARTICLE

Thoni V. Philip, and Ralph L. Vedder, both of Reading, Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed June 16, 1970, Ser. No. 46,828

Int. Cl. C22c 39/20, 39/50, 39/54

U.S. Cl. 148—36 6 Claims

A deep air-hardened alloy steel article having high strength and good toughness in its heat treated condition containing 0.07–0.8 percent carbon, 0.5–2 percent silicon, 0.5–1.5 percent chromium, 0.25–1.5 percent molybdenum, 2–5 percent nickel, and 0.65–4 percent copper.

3,713,906

NITRIDED TANTALUM BASE ALLOYS

Ray J. Van Thyne, Oak Lawn, and John J. Rausch, Antioch, Ill., assignors to Surface Technology Corporation, Stone Park, Ill.

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,571

Int. Cl. C22c 27/00; C23c 11/14

U.S. Cl. 148—31.5 1 Claim

A novel group of nitrided alloys having excellent wear and abrasion resistance containing as their major constituent one metal of the group columubium, tantalum and vanadium alloyed with titanium and/or zirconium. Such alloys are fabricable to shape and are then nitrided to produce high surface hardness thereon. The nitrided alloys having utility as cutting tool materials and other areas of use where excellent wear and abrasion resistance is desired.

3,713,907

GRADED MULTIPHASE MATERIALS

Ray J. Van Thyne, Oak Lawn, and John J. Rausch, Antioch, Ill., assignors to Surface Technology Corporation, Stone Park, Ill.

Filed Dec. 18, 1970, Ser. No. 99,366

Int. Cl. C22c 27/00; C23c 11/14

U.S. Cl. 148—31.5 17 Claims

A carburized, multiphase material formed of at least one metal of each of Group I, II, and III. Group I is columbium, tantalum, and vanadium; Group II is titanium, zirconium and hafnium; and Group III is molybdenum, tungsten, rhenium and chromium. Have excellent abrasion resistance.

3,713,908

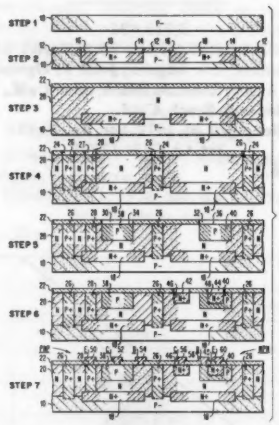
METHOD OF FABRICATING LATERAL TRANSISTORS AND COMPLEMENTARY TRANSISTORS

Benjamin Agusta, and Eneil D. Lubart, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 646,245, June 15, 1967, Pat. No. 3,524,113. This application May 15, 1970, Ser. No. 48,656

Int. Cl. H01l 7/36, 11/00

U.S. Cl. 148—175 3 Claims



This disclosure is primarily directed to the fabrication and construction of complementary PNP–NPN semiconductor devices in a monlithic integrated form. The devices of this disclosure use an isolation-type diffused region to form at least an emitter region thereby permitting the formation of complementary devices with both emitters having a high injection efficiency.

3,713,909

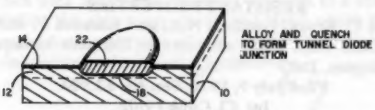
METHOD OF PRODUCING A TUNNEL DIODE

Allan F. Rosevear, Irvine, and Ferdinando M. Acampora, Buena Park, both of Calif., assignors to North American Rockwell Corporation

Continuation of Ser. No. 635,914, May 3, 1967, abandoned. This application Nov. 6, 1970, Ser. No. 87,594

Int. Cl. H01l 7/46

U.S. Cl. 148—179 8 Claims



A tunnel diode having a substantially flat junction area. The diode is fabricated on a heavily doped semiconductor substrate by chemical vapor deposition of a film of elemental dopant (of a conductivity type opposite that of the substrate) over the surface layer; depositing metal over a portion of the dopant film, the area covered corresponding to the desired shape of the diode junction; and alloying the metal, the dopant film and the surface layer to form a tunnel diode junction. Diodes thus produced exhibit strain sensitivity and may be used to measure the magnitude of bending stresses applied to the substrate.

3,713,910

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

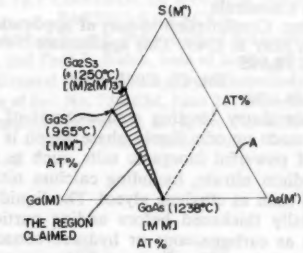
Haruhiro Matino, 1–18–6 Nishiogi Minami, Suginami-ku, Tokyo, Japan

Filed Oct. 29, 1969, Ser. No. 872,086

Claims priority, application Japan, Oct. 31, 1968, 43/78,902

Int. Cl. H01l 7/34

U.S. Cl. 148—1.5 6 Claims



A method for manufacturing a semiconductor device which, when the elements of Group VI such as sulphur (S) are diffused in a semiconductor formed of compounds of the elements of Groups III and V such as gallium arsenide (GaAs) to form a junction in said semiconductor, comprises preparing a dopant source from a composition consisting of such proportions of gallium, arsenic and sulphur as do not present a liquid phase during said diffusion process.

3,713,911

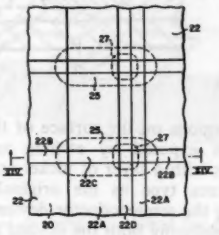
METHOD OF DELINEATING SMALL AREAS AS IN MICROELECTRONIC COMPONENT FABRICATION

Melvyn W. Larkin, Southampton, Hampshire, England, and Richard K. Matta, Irwin, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 588,882, Oct. 24, 1966, abandoned. This application May 26, 1970, Ser. No. 40,626

Int. Cl. H01l 7/44

U.S. Cl. 148—187 13 Claims



Overlapping geometric areas, such as intersecting stripes are used to define precise small areas while minimizing alignment problems. The method can be applied to making diffusion windows in semiconductor manufacture.

3,713,912

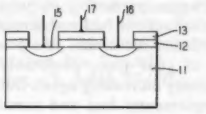
GALLIUM ARSENIDE FIELD EFFECT STRUCTURE

Bertram Schwartz, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 11, 1971, Ser. No. 114,551

Int. Cl. H01l 7/44

U.S. Cl. 148—187 3 Claims



A technique is described for the fabrication of a self-registered gallium arsenide field effect structure including at least one semi-insulating surface layer. The technique involves forming a semi-insulating layer including a surface coating on a conductive material upon the surface of n-type gallium arsenide, generating a pair of windows in such layer and introducing either a p-type or n-type material through the windows.

3,713,913

METHOD OF PRODUCING DIFFUSED SEMICONDUCTOR COMPONENTS FROM SILICON

Rudolf Wolffe, Gilching, Dieter Rucker, Hohenschaftlarn, and Uta Lauerer, Neugermering, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 12, 1969, Ser. No. 884,617

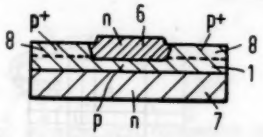
Claims priority, application Germany, Dec. 20, 1968, P 18 16 084.4

Int. Cl. H01l 7/34

U.S. Cl. 148—187 5 Claims

A method of producing a semiconductor component from silicon as the original material and at least two

regions of variable conductance type produced by diffusion. The entire surface of a silicon wafer of a specific conductance type constituting the original body is coated with a doping substance in order to produce a region of opposite conductance type. Thereafter the dopant on the surface of the crystal wafer is removed by a mesa etching, with the exception of the component regions to be



redoped. The regions on the surface of the crystal wafer that have been exposed by etching are provided by chemical means with a layer of nickel and dopant of the same conductance type as the original material. The regions defining the semiconductor device component are produced by indiffusing both the dopant of opposite conductance type and the dopant applied from the nickel layer into the semiconductor component.

3,713,914

STIFF AQUEOUS EXPLOSIVE COMPOSITION CONTAINING GILSONITE

Melvin Alonzo Cook, and Donald T. Bailey, both of Salt Lake City, Utah, assignors to Ireco Chemicals, Salt Lake City, Utah

Continuation-in-part of Ser. No. 497,442, Oct. 18, 1965, abandoned. This application Feb. 22, 1971, Ser. No. 117,746

Int. Cl. C06b *1/04*

U.S. Cl. 149—2 **3 Claims**

A stiff or highly viscous explosive composition of high sensitivity to detonation is made up of a mixture of 40 to 60 parts by weight, based on total composition, of ammonium nitrate and 15 to 35 parts of sodium nitrate at least partly dissolved in 8 to 15 parts of water, preferably including 1.5 to 5 parts of gilsonite as a carbonaceous fuel and sensitizer, 2 to 4 parts of paint grade fine flaked aluminum as a primary sensitizer and 0.3 to 4 parts of guar gum, preferably crosslinked, as a thickener or viscosity increasing agent. Sulfur is preferably included as a supplemental fuel and sensitizer. The slurry is plastic but preferably stiff enough to package in sticks analogous to dynamite.

3,713,915

THICKENED NITROMETHANE EXPLOSIVE CONTAINING ENCAPSULATED SENSITIZER

Clarence R. Fast, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 3,511, Jan. 16, 1970, abandoned. This application Nov. 23, 1970, Ser. No. 95,005

Int. Cl. C06b *19/00*

U.S. Cl. 149—2 **2 Claims**

A liquid explosive primarily based on nitromethane contains small amounts of a sensitizer (an organic amine), a thickening agent, and up to 25 percent powdered aluminum. It may additionally incorporate ammonium nitrate, either per se or in an aqueous solution emulsified into the oily ingredients. Enough of the thickening agent is used to give the resultant liquid explosive low filtrate rate. Thus there is retarded tendency of the explosive to leak away into permeable earth formations. As a result it may be used in creating fractures in fluid-bearing formations and increasing drainage areas in wells. In fact, such a liquid may be used first without detonation to fracture a subsurface formation in which to place the major part of the explosive. It also has the very advantageous property of causing detonation to progress along the explosive even when it is in relatively thin cracks in the rock. The sensitizer is preferably encapsulated in quite small capsules of a solid slowly soluble in nitromethane and essentially insoluble in the sensitizer itself. The encapsulated sensitizer is added to the other components just before pumping into the well to minimize likelihood of premature explosion.

3,713,916

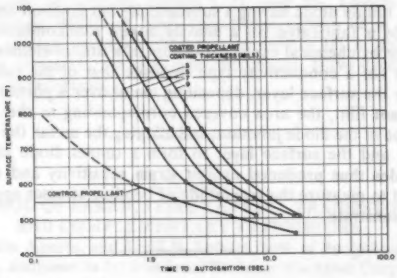
SURFACE COATED SMOKELESS PROPELLANT CHARGE FOR CASELESS AMMUNITION HAVING HEAT RESISTANT PROPERTIES

Edmund C. Braak, Landing, N.J., and Kenneth P. McCarty, Salt Lake City, Utah, assignors to Hercules Incorporated Wilmington, Del.

Filed July 7, 1970, Ser. No. 52,904

Int. Cl. C06b *19/02*

U.S. Cl. 149—12 **7 Claims**



A propellant charge for caseless ammunition is provided comprising a base propellant charge and a heat and combustible combustible surface coating bonded to the exterior surface of the base charge. This surface coating functions to prevent undesired autoignition of the base charge. The surface coating is an intimate admixture of a crosslinked polyacrylic rubber binder and an organic oxidizer.

3,713,917

BLASTING SLURRY COMPOSITIONS CONTAINING CALCIUM NITRATE AND METHOD OF PREPARATION

Melvin A. Cook, Salt Lake City, Robert B. Clay, Bountiful, and Lex L. Udy, Salt Lake City, Utah, assignors to Ireco Chemicals

No Drawing. Continuation-in-part of application Ser. No. 821,095, May 1, 1969. This application Nov. 16, 1970, Ser. No. 90,005

Int. Cl. C06b *1/04*

U.S. Cl. 149—20 **8 Claims**

Pumpable slurry blasting compositions of high sensitivity are made up of a liquid phase which is an aqueous solution of powerful inorganic salts, such as ammonium and/or sodium nitrate, including calcium nitrate, plus a liquid fuel such as ethylene glycol. The liquid phase is at least partially thickened before adding particulate solid fuels such as carbonaceous or hydrocarbonaceous solids (coal, gilsonite) and/or heat-producing metals, such as aluminum, magnesium, or boron. Self-explosive particles of TNT, smokeless powder, etc., can be used with or in lieu of other fuels. Proportions of calcium nitrate and total liquid are so selected that, on cooling from an elevated preparation temperature, the calcium salts crystallize out in substantial proportions, thus taking up water of crystallization, in effect increasing viscosity of the slurry to condition such that it is not pumpable by conventional pumping means, and thus improving and maintaining sensitivity and detonability to levels suitable for small diameter charges.

3,713,918

UREA STABILIZED GELLED SLURRY EXPLOSIVE

David R. Forshey, Bethel Park, and Ermete C. Lisotto, Pittsburgh, both of Pa., assignors to the United States of America as represented by the Secretary of the Interior

Filed Nov. 18, 1970, Ser. No. 90,804
Int. Cl. C06b 1/04
U.S. Cl. 149—21 10 Claims

A highly stable cap sensitive explosive gel comprising ammonium nitrate, metallic fuel sensitizer, gelling agent, inorganic polyvalent metal salt cross-linking agent, phosphate buffer, water and urea in an amount of 0.3–0.7 weight percent. When urea is added in the same amounts to a composition including the above ingredients and NaCl, which NaCl is incorporated for the purpose of non-incendivity, a highly stable non-incendive explosive gel is formed.

3,713,919

CHEMICAL FOAMING OF WATER-BEARING EXPLOSIVES WITH N,N'-DIMITROSOPENTAMETHYLENE-TETRAMINE

Ernst A. Tomic, Hagerstown, Md., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 17, 1970, Ser. No. 64,580
Int. Cl. C06b 1/04
U.S. Cl. 149—47 18 Claims

Making foamed semisolid colloidal dispersions of water-bearing blasting agents containing an inorganic oxidizing salt, e.g., ammonium nitrate, fuel, water and adding thereto the gas-generating material N,N'-dinitrosopentamethylenetetramine that foams and sensitizes the blasting agent.

3,713,920

METHOD OF PRODUCING HEAT IN A CHEMICAL REACTOR

Johann Schroder, Aachen, Germany, and Willem Ludovicus Nicolaas van der Sluys, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Oct. 1, 1970, Ser. No. 77,120
Claims priority, application Netherlands, Oct. 3, 1969, 6915057
Int. Cl. C06d 5/02
U.S. Cl. 149—109 2 Claims

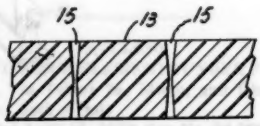
Production of heat by reacting a mixture of SF_6 and Cl_2 with Li in a chemical reactor.

3,713,921

GEOMETRY CONTROL OF ETCHED NUCLEAR PARTICLE TRACKS

Robert L. Fleischer; Paul B. Price, both of Schenectady; Edgar E. Bostick, and Fred F. Holub, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 739,034, June 21, 1968, abandoned. This application April 1, 1971, Ser. No. 130,514
Int. Cl. C08f 27/00, 47/12
U.S. Cl. 156—2 8 Claims



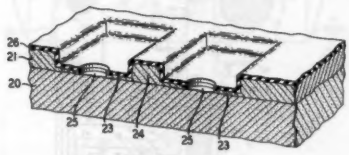
A process for making holes of reduced taper in a solid containing tracks of radiation damaged material by contacting the solid with an etchant containing a surfactant. The product is useful as a filter.

3,713,922

HIGH RESOLUTION SHADOW MASKS AND THEIR PREPARATION

Martin Paul Lepselter, Bethlehem, Pa., and Alfred Urquhart MacRae, Berkeley Heights, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 28, 1970, Ser. No. 101,592
Int. Cl. C23f 1/02
U.S. Cl. 156—16 4 Claims



The specification describes a method for preparing a thin silicon high resolution shadow mask, the latter adapted especially for use in processing materials by ion implantation. The method makes use of the preferential etch technique for silicon in which, for example, $n+$ material can be electrolytically removed in preference to higher resistivity n-type silicon. A thin (e.g. $< 10\mu$) epitaxial layer of n-silicon is deposited on an n+ substrate. The open regions of the mask are then converted, through the thickness of the epitaxial layer, to $n+$ material. After exposure to the preferential electrolytic etch treatment, a thin silicon shadow mask is left. Also disclosed are ribbed structures for enhancing the physical durability of the mask and techniques using crystallographic etching for further improving resolution.

3,713,923

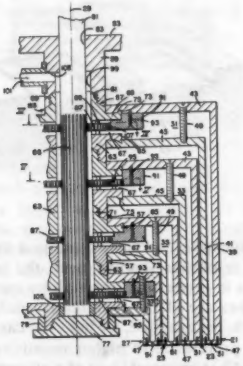
METHOD OF ASSEMBLING SLIDER WITH A PROFILED STRIP SEPARABLE FASTENER

Leon Ker Laguerre, Boulogne-sur-Seine, France, assignor to Minigrip Inc., Orangeburg, N.Y.

Original application Feb. 26, 1968, Ser. No. 708,142, now Patent No. 3,426,396. Divided and this application Oct. 23, 1968, Ser. No. 770,023
Int. Cl. A41h 37/00
U.S. Cl. 156—66 8 Claims

A method of assembling slide or slider for fasteners of satchels formed of complementary profiled fastener strips and comprising a small plate having two convergent lateral walls and a central partition therebetween; the said slide is made of a sufficiently flexible material so as to be engageable by resilient deformation by the upper edge of the strips, perpendicularly to their longitudinal direction, the lower faces of said flanges being inclined toward the opening provided between those walls, so as to facilitate this engagement.

3,713,924
MANUFACTURE OF EXTRUDED NETS HAVING INTEGRAL STRAND JUNCTIONS
Theodore H. Fairbanks, Liverpool, Pa., assignor to FMC Corporation, Philadelphia, Pa.
Continuation-in-part of application Ser. No. 872,089, Oct. 29, 1969, now Patent No. 3,654,031. This application July 9, 1971, Ser. No. 161,077
Int. Cl. D04h *3/16*
U.S. Cl. 156—167 5 Claims



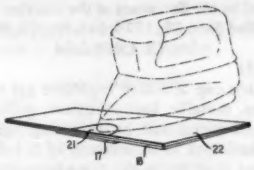
A method for making an extruded net-like structure having intersecting mesh strands in which at least portions of certain mesh strands pass directly through other mesh strands at their locations of intersection and are bonded thereat.

3,713,925
ASBESTOS SHEET MATERIAL DIRECTLY ADHERED TO A CELLULAR FOAM SUBSTRATE
Rowland S. Hartzell, Gibsonia, Pa., and Gene Gerek, Oswego, Ill., assignors to PPG Industries Inc., Pittsburgh, Pa.
Division of Ser. No. 717,074, March 29, 1968, Pat. No. 3,522,140. This application , Ser. No. 30,478
Int. Cl. B32b *31/14*
U.S. Cl. 156—78 5 Claims

Durable sheet products are provided by coated asbestos sheet material adhered to a cellular foam substrate. In preferred embodiments a vinyl foam, a polyurethane foam or polystyrene foam is produced in contact with asbestos paper coated with an organic coating composition; in some cases the foam has an adhesive layer on the exposed surface or the coating on the asbestos is an adhesive.

3,713,926
METHOD FOR PATCHING MATERIALS
Lawrence Speer, Barberton, N.J., assignor to Vyna-Chem, Inc., Bound Brook, N.J.
Filed Dec. 5, 1969, Ser. No. 882,488
Int. Cl. B32b *35/00*
U.S. Cl. 156—98 8 Claims

A process for forming a patch for plastic and leather-like materials comprising removing the defective area, filling the void with an uncured material, covering this with graining paper and curing the filler material by placing a hot surface over and in contact with the graining

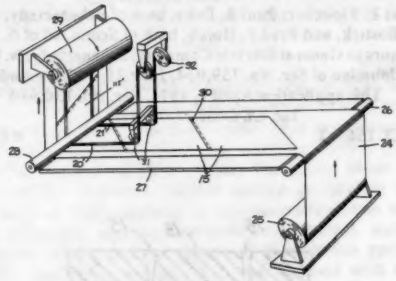


paper, then moving the heat source with respect to the graining paper and finally removing the heat source and said graining paper.

3,713,927
THERMOSETTABLE SHEET MOLDING COMPOUND AND METHOD OF MAKING
Frank C. Peterson, and Leslie P. Theard, both of Pittsburgh, Pa., assignors to Gulf Oil Corporation, Pittsburgh, Pa.
Filed June 11, 1971, Ser. No. 152,376
Int. Cl. B29j *5/00*
U.S. Cl. 156—62.6 17 Claims

A resin-fiber glass mixture is sprayed-up and partially cured to a flexible, non-tacky sheet molding compound for second stage curing to a solid, infusible resin in a heated mold. The mixture is sprayed-up into a relatively flat sheet of one layer or two or more separable layers or with a variable thickness, if desired, to conform to the profile of the part to be molded. The resin comprises a polyanhydride, such as the copolymer of maleic anhydride and an alpha-olefin, an olefinically unsaturated monooxirane compound such as glyeidyl methacrylate, and an olefin such as styrene.

3,713,928
TIRE CARCASS FABRICATING METHOD
Werner W. Klingbeil, Paterson, N.J., and Eugene H. Hartman, Venice, Fla., assignors to Uniroyal, Inc., New York, N.Y.
Original application Mar. 18, 1968, Ser. No. 713,935, now Patent No. 3,616,132. Divided and this application Feb. 19, 1971, Ser. No. 116,889
Int. Cl. B29h *17/28*
U.S. Cl. 156—123 1 Claim

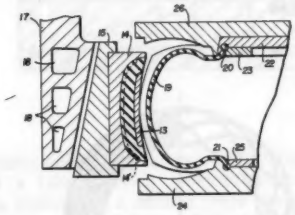


Distortion of tire cord fabric in tire building operations is avoided by adhering to the pieces of cord fabric external strands arranged parallel to the lateral edges of the piece to reduce the stretch of the cord fabric, the strands taking longitudinal stresses as the pieces are pulled in the tire building operation.

3,713,929
METHOD FOR PARTIALLY CURING AND BUILDING UP PNEUMATIC TIRES

Franco Bottasso, Via Sismondi 9, and Antonio Pacciarini, Via Caracciolo 26, both of Milan, Italy, and Renato Caretta, Via Mameli 28, Gallarate, Italy

Filed May 27, 1970, Ser. No. 40,875
Claims priority, application Italy, May 31, 1969, 17,602/69
Int. Cl. B29h 5/04
U.S. Cl. 156—127 13 Claims



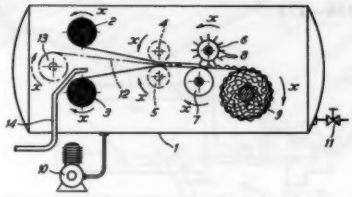
A method and apparatus for constructing pneumatic tires capable of producing a tread band of a very high degree of uniformity in the thickness of the band along the entire development of the finished tire. The method includes the steps of building up the carcass, applying the tread band about a rigid annular surface, coaxially disposing the tread band supported by the rigid annular surface in a mold having a plurality of sectors each provided on its inner face with radial sculptures to form the desired recesses in the tread band, heating and compressing the tread band against the rigid annular surface using the sectors of the mold to cause complete penetration of the sculptures in the band and to mold and partially cure the band in a cavity defined entirely by rigid surfaces, removing the rigid annular surface supporting the tread band, positioning the carcass coaxially within the space defined by the tread band, shaping the carcass and forcing the mid-circumferential portion of the carcass against the tread band by admitting a compressed fluid in the carcass and also approaching the beads of the carcass. The apparatus used to carry out the method comprises rigid sectors forming a generally circular ring, the sectors having on their inner surface sculptures to form the desired configuration of the outer surface of the tread of the finished tire which are radially displaced and heated. A rigid ring is coaxially positioned within a space defined by the sectors to define with the sectors a cavity in which the radial sections thereof have a constant form and size, the outer profile of the rigid ring corresponding to the desired outer profile of the carcass of the finished tire. Means are utilized for coaxially supporting the carcass in the space defined by the sectors while the rigid ring is out of the space, together with means for introducing compressed fluid in the carcass and means for moving the beads of the carcass towards each other.

3,713,930
PROCESS TO FORM ELEMENTS UNDER PRESSURE

Tullio Levrini, Via Turati 26, Milan, and Giuseppe Corti, Casana, Como, both of Italy

Filed April 16, 1970, Ser. No. 29,007
Claims priority, application Italy, April 19, 1969, 15855/69
Int. Cl. B29c 17/00; B29h 7/04
U.S. Cl. 156—147 20 Claims

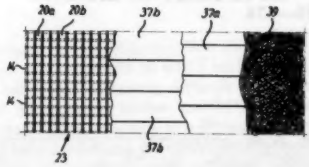
The process concerns the realization of elements comprising sealed cavities filled with pressurized gas. Said process consists in arranging, in a pressurized chamber, sheets of plastic material; in forming, in at least one of said sheets, cavities which are filled with said pressurized gas; in closing and sealing said sheets according to a closed outline, in such a way as to form one or several closed cavities which, being situated in an ambient with normal pressure (atmospheric pressure) permits the expansion of the gas contained in said cavity or cavities.



3,713,931
METHOD FOR PRODUCING A NON-WOVEN FABRIC

Flemming Lerche-Svendsen, 2920 Charlottenlund, Denmark, assignor to Aktieselskabet Fibertex, Aalborg, Denmark

Filed March 17, 1971, Ser. No. 125,043
Claims priority, application Denmark, March 20, 1970, 1442/70
Int. Cl. B32b 31/18
U.S. Cl. 156—148 10 Claims



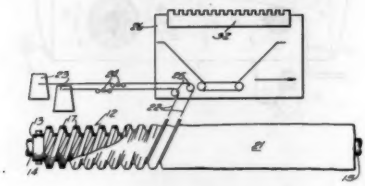
A non-woven continuous fabric comprises a plurality of discrete, laterally extending ribbon elements which are connected with continuous, longitudinally extending elements to form a netting which may be united with one or more layers of a continuous sheet plastics material orientated in the longitudinal direction of the fabric while at least the ribbon elements of the netting are also longitudinally orientated, i.e., in the lateral direction of the fabric. The fabric has been subjected to a needle punching operation causing the orientated materials thereof to fibrillate. A fiber fleece may be incorporated in the fabric. A method of producing the fabric comprises winding a continuous, longitudinally orientated ribbon of plastics material helically upon a plurality of thread- or ribbon-shaped secondary elements to form a netting which may be laid together with one or more sheets of longitudinally orientated plastics material to form a web assembly which subsequently is subjected to a needle punching operation. An apparatus for making the fabric comprises means for jointly feeding a netting and at least one sheet in superposed relationship and a needle punching device operating on the assembly of the netting and the sheet or sheets.

3,713,932

METHOD OF MAKING LOW FRICTION FABRIC LINED NUTS OF MULTIPLE LENGTH CONSTRUCTION

Neil W. Butzow, Greendale, and Bernard Harris, Milwaukee, both of Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Dec. 15, 1970, Ser. No. 98,469
Int. Cl. B32b *5/12*; B65h *81/08*
U.S. Cl. 156—173 4 Claims



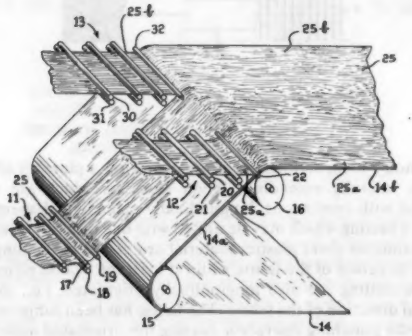
A low friction fabric sleeve is wrapped with cords on a long threaded mandrel. The assembly is heated to preset the fabric. A tubular body of resin and glass filament reinforcing is formed over the sleeve and when completed and unscrewed from the mandrel, is cut to the lengths of the desired nuts or internally threaded parts. The tips of the screw threads may include the cords which were wound under tension to form the sleeve on the mandrel.

3,713,933

METHOD FOR PRODUCING NON-WOVEN WEBS

Robert C. Sokolowski, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of abandoned application Ser. No. 713,092, Mar. 14, 1968. This application Jan. 25, 1971, Ser. No. 109,618
Int. Cl. D04h *1/00*; B32b *5/02*
U.S. Cl. 156—176 7 Claims



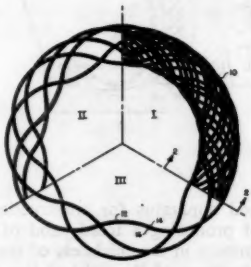
A method and apparatus for producing extra wide and/or laminated non-woven webs from very thin, lightweight arrays of highly-drafted and aligned fibers. The fibers are drafted and aligned into thin webs by separate draw frames and deposited at selected points and particular angular orientation on an inclined moving belt. Deposition is made in juxtaposed side-by-side arrangement for wide webs, or one ply upon another when a laminated construction is desired. The planar angle at which each web is deposited on the receiving belt is arranged with respect to the plane of the belt so that the fibers are held under tension during the entire operation.

3,713,934

METHOD OF PRODUCING FRICTION FACINGS

Henry C. Morton, East Greenbush, N.Y., assignor to The Bendix Corporation

Division of Ser. No. 810,277, March 25, 1969, Pat. No. 3,600,258. This application Sept. 28, 1970, Ser. No. 76,242
Int. Cl. B31c *13/00*; B32b *5/08*, *5/26*
U.S. Cl. 156—180 6 Claims



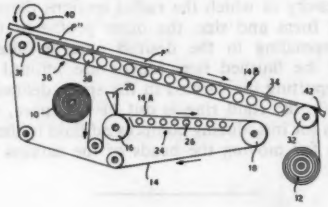
A friction facing for clutches and the like is disclosed which incorporates at least one yarn of filamentary glass fibers in the friction material prior to final fabrication to improve the burst strength of the friction facing. Additionally, bundles of filamentary treated glass fibers may be added to the facing at the I.D. and/or at the O.D. to further improve the hot burst strength of the friction facing.

3,713,935

PROCESS AND APPARATUS FOR COATING PANELS WITH RESINOUS COMPOSITIONS

Giorgio Grecchi, Via Verga 17/A, Cadorago, Italy

Filed July 18, 1969, Ser. No. 842,899
Claims priority, application Italy, July 20, 1968, 52533-A/68
Int. Cl. B01j *1/10*
U.S. Cl. 156—231 4 Claims



In a process and apparatus for coating a panel with a resinous composition such as varnish or paint, a coating material which is normally fluid but which hardens under ultraviolet radiation is used. A layer of the composition is deposited on a bed permeable to ultraviolet radiation, and the layer is irradiated through the bed to cause part of its thickness to set. Then the panel is located on the layer and irradiation is continued until the coating has hardened fully.

3,713,936

FABRIC MOLDING

Alston Ramsay, Jr., Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Original application Aug. 12, 1968, Ser. No. 751,778. Divided and this application Feb. 1, 1971, Ser. No. 111,652

Int. Cl. B24c 5/00

U.S. Cl. 156—242 1 Claim

Laminates comprising an internal batting, a first outer layer of a fabric having sufficient directional stretchability to conform to a molded shape and a second outer layer of a particulate thermoplastic fusible into a tough, stiff backing may be molded into rigid, strong, three dimensional fabric articles having a permanent resistance to shape deformation.

3,713,937

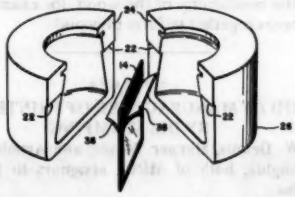
METHOD OF MAKING FLEXIBLE WASTE RECEPTACLE FOR MARINE TOILETS

Don W. Eichner, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 18, 1970, Ser. No. 38,429

Int. Cl. B29c 19/00

U.S. Cl. 156—245 5 Claims



The invention is a flexible waste receptacle for marine toilets including the process of making such a receptacle. The flexible waste receptacle includes a flexible bag having a filter screen molded in place within the bag to form a first compartment for waste fluid and a second compartment for filtered flush fluid. The flexible bag is formed by a rotational molding process. The appropriate fittings and straps may be heat sealed to the bag to complete the assembly of the flexible waste receptacle.

3,713,938

PRODUCTION OF POLYURETHANE FILM/SPLIT LEATHER LAMINATE

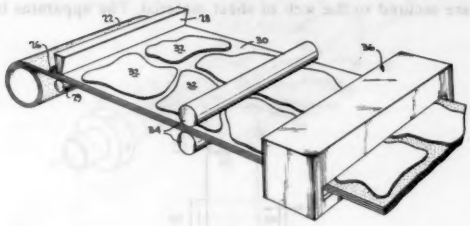
Robert G. Sutton, Philadelphia, Pa., assignor to Norwood Industries Inc., Malvern, Pa.

Continuation-in-part of Ser. Nos. 659,101, Aug. 8, 1967, abandoned, and Ser. No. 737,116, June 14, 1968, abandoned. This application March 9, 1970, Ser. No. 17,572

Int. Cl. B29c 19/00

U.S. Cl. 156—246 4 Claims

Production of laminated articles by casting and drying a layer of a fully-reacted polyurethane material on a release treated carrier in a manner to form a moisture vapor-permeable and moisture-impermeable film, one or more hides of split leather being bonded to the supported film through a moisture vapor-permeable tie-coat of a compatible adhesive, and the carrier then being removed. The resultant split leather/polyurethane film product has the appearance and other properties of top-grain leather.



3,713,939

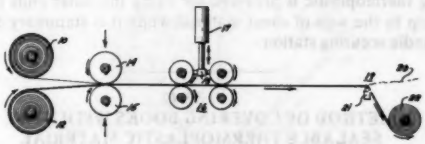
METHOD OF PROCESSING ARTICLES OF VERY THIN PLASTIC FILM MATERIAL

Robert Preg, Reading, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed March 4, 1970, Ser. No. 16,380

Int. Cl. B32b 31/08, 31/18

U.S. Cl. 156—248 4 Claims



A technique for handling very thin plastic film which, due to a thickness of from 0.002 to 0.015 inches, is extremely flexible, and otherwise extremely difficult to handle. The plastic nature of the material further makes it subject to the tribo electric phenomena resulting in a tendency to adhere to other objects. These adversities are eliminated by laminating an extended web of relatively stiff, pressure sensitive, adhesive backing material to the thin film prior to stamping components of relatively small size therefrom. In the stamping operation the backing material is not cut through. Thus, the cut pieces of thin film remain affixed to the extended web of backing material until they arrive at the point of end use. The relatively low peel strength of the pressure-sensitive backing material facilitates the ready removal of the cut pieces of thin film at the point of end use while at the same time ensuring that the thin film and backing material do not become disassociated during the various phases of the processing operation.

3,713,940

METHOD FOR SECURING HANDLES TO SHEET MATERIAL

Gordon A. Haugh, Jr., Etobicoke, Ontario; Arturo Grassi, Mississagua, Ontario, and Gordon A. Haugh, Port Credit, Ontario, all of Canada, assignors to Gordon Haugh Packaging Company Limited, Toronto, Ontario, Canada

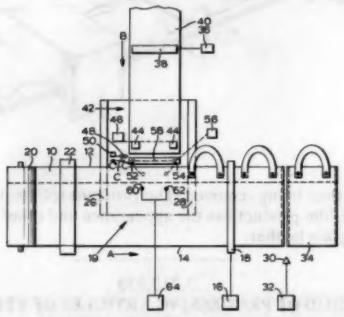
Filed May 1, 1970, Ser. No. 33,610

Int. Cl. B32b 31/18, 31/20

U.S. Cl. 156—250 7 Claims

A method and apparatus for automatically securing a handle in the form of a flexible strip to a web of sheet material,

such as plastic. According to the method, the web of sheet material is fed intermittently to a handle securing station. The outer ends of the flexible handle strip are moved towards each other and into juxtaposition with the web of sheet material at the handle securing station and, while the web is stationary at the handle securing station, the outer ends of the handle strip are secured to the web of sheet material. The apparatus in-



cludes movable clamp means for releasably engaging the outer ends of the handle strip and for moving the ends towards each other and into juxtaposition with the adjacent web of sheet material. Securing means, such as an apparatus for heat welding thermoplastic is provided for fixing the outer ends of the strip to the web of sheet material while it is stationary at the handle securing station.

3,713,941

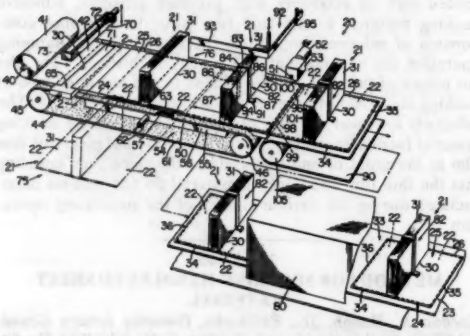
METHOD OF COVERING BOOKS WITH HEAT SEALABLE THERMOPLASTIC MATERIAL

Richard J. Saurs, Richmond, Va.

Division of Ser. No. 748,869, July 30, 1968, abandoned. This application July 30, 1970, Ser. No. 64,907

Int. Cl. B18b *31/20*

U.S. Cl. 156—251 **7 Claims**



A rectangular slot is cut in one layer of a folded covering material. The opened covers of a book are inserted between the layers, with the pages extended through the slot. Then the edges of the layers are sealed to form a cover.

3,713,942

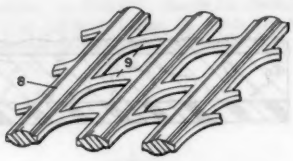
PROCESS FOR PREPARING NONWOVEN FABRICS

Charles W. Kim, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of application Ser. No. 843,561, July 22, 1969. This application Dec. 16, 1969, Ser. No. 885,595

Int. Cl. B32b *31/08*

U.S. Cl. 156—252 **2 Claims**



Nonwoven fabrics are prepared by cross-laying a warp of substantially parallel continuous monofilament strands with a partially fibrillated open network having a plurality of interconnected parallel continuous monofilament strands at an angle of 90° to the warp and bonding the same.

3,713,943

WOOD TREATING PROCESS

Richard R. Huff, Eugene, Oreg., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 5, 1970, Ser. No. 61,488

Int. Cl. B27k *3/36;* **B32b** *31/12;* **B44d** *1/28*

U.S. Cl. 156—255 **6 Claims**

The treatment of green or undried wood with a polyethylene adduct of a compound containing multi active-hydrogen functionality is described. Such treatment of wood improves the bondability of the wood; for example, the adhesion of veneers together to form plywood.

3,713,944

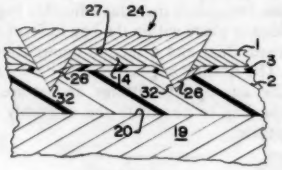
METHOD OF MANUFACTURE OF PRINTED CIRCUITS BY DIE STAMPING

Herman W. Dennis, Harper Woods, and Arnold Birko, Dearborn Heights, both of Mich., assignors to Essex International, Inc.

Filed May 28, 1970, Ser. No. 41,376

Int. Cl. B32b *31/18*

U.S. Cl. 156—261 **14 Claims**

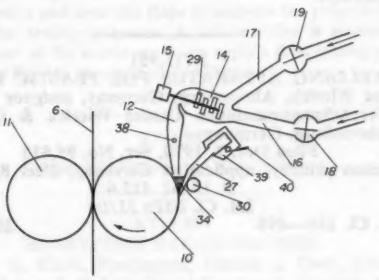


The manufacture of a printed circuit comprises arranging an adhesive-free, electrically conductive sheet in overlying relation with a non-conductive backing sheet coated with a dry, thermoplastic adhesive. A heated die having contours conforming generally to the configuration of conductive circuit elements to be bonded to the backing engages the conductive sheet and fuses the circuit elements to the backing sheet. The overlying sheets then are indexed to a cutting station at which the sheets are supported on a hard, flat base and

a cutting die having cutting edges corresponding to the marginal outlines of the circuit elements is dropped onto the overlying sheets to cut the circuit elements from the conductive sheet. The cutting edges of the cutting die project from the lands they surround a distance greater than the thickness of the conductive sheet, but less than the combined thickness of the conductive sheet, the backing sheet, and the adhesive coating so that the backing sheet is neither cut nor permanently deformed. Following the cutting operation the conductive sheet from which the circuit elements have been cut is removed and an overlay sheet of insulation is applied over the circuit elements and bonded to the latter and to the backing sheet.

3,713,945
METHOD FOR MAKING FIBER REINFORCED PLASTIC

Johan Bjorksten, P.O. Box 265, Madison, Wis. 53701
Continuation of abandoned application Ser. No. 698,544, Jan. 17, 1968. This application Aug. 17, 1970, Ser. No. 64,606
Int. Cl. B32b *31/06, 31/12*
U.S. Cl. 156—278 **14 Claims**

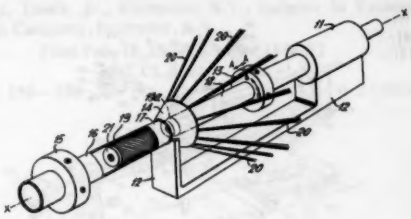


A reinforced plastic film is made by binding fibers to at least one base film by means of a nascent adhesive formed from two or more components immediately before application to the film and (a) reacted almost completely within the seconds required for it to pass from adhesive applicator to laminator, or (b) brought within that time to a heavy enough consistency for holding the components together and then completing cure in storage. An adhesive applicator capable of operating with a rotogravure roller with a compound which may dry in seconds after preparation is accomplished by dispensing with the conventional adhesive pan and supplying the nascent adhesive directly to a doctor blade resting on an intagliated roller and equipped with an averaging electronic level control.

3,713,946
METHOD OF MAKING FIBER REINFORCED COMPOSITES

Walter Guillam Molyneux, Farnborough, Hampshire, England, assignor to National Research Development Corporation, London, England
Filed April 23, 1970, Ser. No. 31,150
Claims priority, application Great Britain, April 30, 1969, 22,043/69
Int. Cl. B29c *19/00*
U.S. Cl. 156—293 **2 Claims**

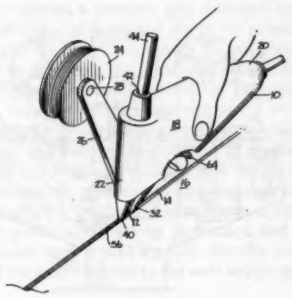
A process for producing a composite material article comprising inserting an inner member together with a mixture of fibrous reinforcement impregnated with partially cured resin, the mixture at least partially enveloping the inner member,



into a hollow sheath wherein the mixture fills the space between the inner member and the hollow sheath.

3,713,947
WIRING METHOD

Paul Maddison Hawhins, Stillwater, Minn., assignor to General Alarm Corporation, New York, N.Y.
Division of Ser. No. 733,854, June 3, 1968, Pat. No. 3,639,193. This application Dec. 16, 1970, Ser. No. 98,848
Int. Cl. B29c *27/14*
U.S. Cl. 156—293 **3 Claims**



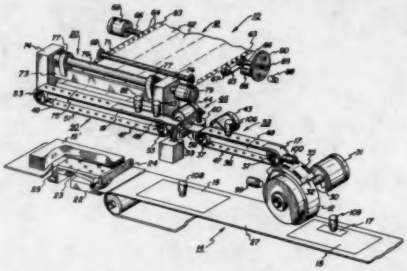
Method and apparatus for installing electrical wire or the like along a predetermined path on the surface of a base member by providing a groove in the surface of the base member along the predetermined path, simultaneously positioning in the groove guide means for laying said electrical wire and nozzle means for applying a material for maintaining the electrical wire within the groove, and then feeding electrical wire and said material to said guide means and nozzle means while moving the guide means and said nozzle means along said groove.

3,713,948
LABELING MACHINE

Jacob N. Kluger, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 14, 1970, Ser. No. 97,759
Int. Cl. B26d *5/00;* **B32b** *31/00;* **G05g** *15/00*
U.S. Cl. 156—351 **11 Claims**

An asynchronous article addressing or labeling apparatus, the components of which are operated independently in response to demand. The apparatus includes a first transport to advance the label supply sheet to a first cutter, the first cutter serving following a predetermined label sheet advance to cut the sheet transversely to provide a strip-like label piece; a strip conveyor to advance the label piece to a second cutter which, following an advance of one label length, cuts an in-

dividual label from the label piece; and a label conveyor to carry the cut label to the apparatus label transfer wheel for transfer to the article being labeled. The label transfer wheel



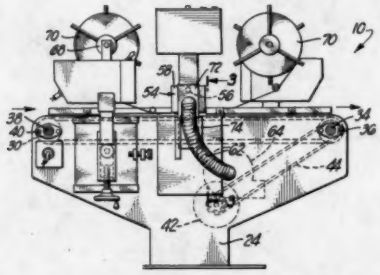
itself is operated in response to advance of the articles to be labeled to a predetermined position adjacent the label transfer wheel.

3,713,949

METHOD OF AND MACHINE FOR APPLYING ADHESIVE LABELS TO PACKAGES

Herbert Dinter, 1300 S. Shadydale, West Covina, Calif. 91790

Filed May 13, 1970, Ser. No. 36,914
Int. Cl. B32b *31/20*; B65c *9/40*
U.S. Cl. 156—363 7 Claims



A method of and a machine for applying adhesive labels to packages by transporting the packages in succession on a conveyor along a prescribed path to labeling position at a labeling station along the path, supporting a label over each package in labeling position with the adhesive side of the label exposed and facing the package, elevating each package in labeling position from the conveyor into bonding contact with the adhesive side of the label to adhere the label to the package, and finally lowering the labeled package back to the conveyor for outfeed movement from the machine. A primary feature of the machine resides in adjustability to accommodate packages of different size and to apply labels to different surfaces of a package.

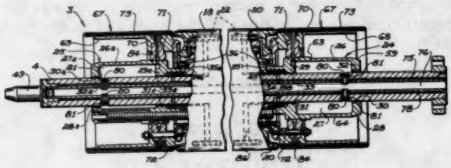
3,713,950

TIRE BUILDING MACHINE WITH TELESCOPIC INTERCONNECTION FOR MOUNTING A BEAD RING HOLDER

Lawrence E. Beal, Wadsworth, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed April 30, 1970, Ser. No. 33,370
Int. Cl. B29h *17/22*
U.S. Cl. 156—401 13 Claims

A tire building machine including a frame and a collapsible tire building drum mounted for rotation thereon. Bead setter units are mounted on the frame adjacent the opposite ends of the drum for registering bead rings therewith. Each of the bead setter units includes a bead ring holder movable toward and away from an adjacent end of the drum. Each end of the drum includes an axially extending protuberance which is adapted for telescopic connection with a respective coaxially



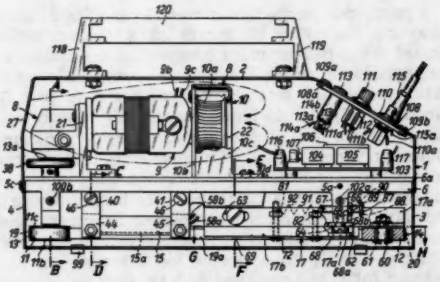
aligned sleeve carried by each of the holders to align the bead rings with respect to the drum. The drum includes inflatable turn-up bladders adjacent the opposed ends thereof and each protuberance comprises a shell having a cavity therein adapted to receive and conduct air under pressure to the turn-up bladders.

3,713,951

WELDING APPARATUS FOR PLASTIC FOILS

Horst Wierick, Ahrensburg, Germany, assignor to BeA-Verpackungsmaschinen Casties Wierick & Co. KG, Ahrensburg, Germany

Filed Dec. 7, 1970, Ser. No. 95,818
Claims priority, application Germany, Dec. 8, 1969, P 19 61 425.6
Int. Cl. B32b *31/08*
U.S. Cl. 156—498 29 Claims

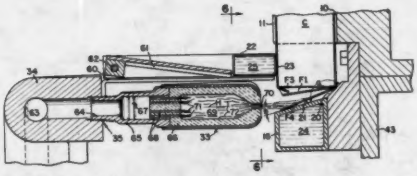


The welding apparatus consists of a motor, a fan mounted on the motor shaft, two pairs of rollers with two circulating endless heat-conductive tapes and heating and cooling blocks at the tapes. The foils are gripped between the tapes and led through the heating and cooling blocks whereby the foils are continuously welded. The fan sucks cooling air around the motor and blows it through the cooling blocks. With this construction the heat dissipation from the motor is improved and the life of the apparatus is lengthened especially by use of polytetrafluoroethylene coated glass fiber tapes instead of conventional steel tapes.

3,713,952
APPARATUS FOR HEAT SEALING CARTONS

George Schafer, Santa Cruz, and Hugh B. Morse, San Jose, both of Calif., assignors to Fibreboard Corporation, San Francisco, Calif.

Filed Oct. 24, 1969, Ser. No. 869,193
Int. Cl. B31b *1/64*
U.S. Cl. 159—497 35 Claims



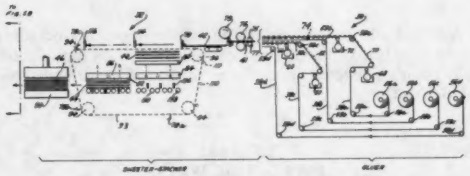
An apparatus for heat sealing cartons comprises conveyor means for moving a partially erected carton along a line of flight and folding means for folding polyethylene coated carton closure flaps into superimposed, partially opened relationship. The carton is then moved past a plurality of spaced nozzle means, each comprising a chamber adapted to have a gaseous fuel communicated thereto and ignited therein. Upon combustion of the fuel, a heated fluid is discharged from the chamber, through a nozzle formed on a forward face of the nozzle means and onto the flaps to activate the polyethylene coating for sealing purposes. A driven roller is positioned downstream of the nozzle means to apply a final sealing pressure to the flaps to secure them together.

3,713,953
Patent Not Issued For This Number

3,713,954
HONEYCOMB MAKING MACHINE

Kenneth G. Clark, Pennington; Thomas J. Cook, Kendall Park; Ernest T. DePass, Bound Brook, and Abraham Manfredonia, Titusville, all of N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Aug. 3, 1970, Ser. No. 60,268
Int. Cl. B32b *31/08, 31/18*
U.S. Cl. 156—548 11 Claims

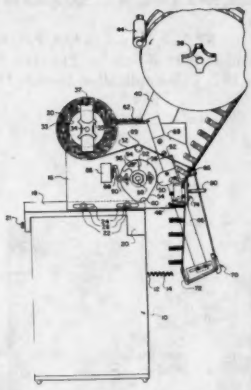


A continuous honeycombed paper making machine is provided which transforms the output of four paper stock rolls into a continuous core of honeycombed material. The machine comprises four sections: a gluer; sheet stacker; pad slicer; and slice combiner. The gluer forms a continuous 4-ply web from the stock rolls by applying adhesive in staggered, longitudinal stripes to the top and bottom surfaces of the first or topmost and third plys. The sheeter-stacker cuts and trims the 4-ply web and accumulates a quantity of sheets into a stack where adjacent sheets are bonded to one another by virtue of the adhesive on the top surface of the topmost ply and then compresses the stack to form a pad. The pad slicer slices each pad into slices extending transverse to the adhesive stripes. The slice combiner applies adhesive to each slice and then positions them in a vertical column where the slices are bonded to one another to form the desired continuous core.

3,713,955
APPARATUS FOR SECURING ARTICLES TO WEB MATERIAL

Frank J. Tanck, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 10, 1971, Ser. No. 114,282
Int. Cl. B32b *31/10*
U.S. Cl. 156—552 2 Claims

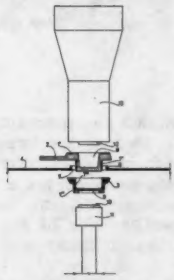


Apparatus for releasably securing presented articles to an elongated strip of web material having a pressure sensitive adhesive coating includes a pressure pad mounted on a pivotal guide arm. Web material is trained about the pressure pad so that movement of the guide arm moves the pressure pad from a first position spaced from the presented articles to a second position pressing web material against the presented article. The web path between the pressure pad and a web material supply roll increases as the pressure pad is moved toward its second position, and a clamp is provided to prevent relative movement between the web material and the pressure pad during such movement, whereupon web material is unwound from the supply roll. Upon return movement of the pressure pad to its first position, the clamp is released and slack web material is wound onto a take-up roll, thereby presenting a new surface of the web material to the next article presented.

3,713,956
METHOD AND APPARATUS FOR HERMETICALLY SEALING A RIGID PANEL

Jean Cospen, Cachan, and Bernard Baumann, Paris, France, assignors to Cebal GP, Paris, France

Filed Jan. 29, 1971, Ser. No. 110,964
Claims priority, application France, Feb. 6, 1970, 7004278
Int. Cl. B30b *31/00*
U.S. Cl. 156—580 7 Claims



The invention is addressed to a new and improved method and apparatus for sealing an opening in a rigid

panel in which first and second sealing members are inserted into the opening in the rigid panel, and subjected to a first lateral mechanical tension, the members are then heated, preferably by ultrasonic heating means and then the members are subjected to a second mechanical tension.

3,713,957

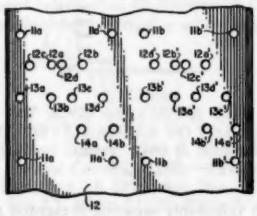
TRUNK FOR COLLAPSIBLE ARTIFICIAL TREE

Terry Hermanson, New York, N.Y., assignor to Mr. Christmas Incorporated

Division of Ser. No. 87,402, Nov. 6, 1970, Pat. No. 3,639,196, and a continuation-in-part of Ser. No. 800,218, Feb. 18, 1969, Pat. No. 3,574,102. This application June 3, 1971, Ser. No. 149,775

Int. Cl. A47g *33/06*

U.S. Cl. 161—14 **1 Claim**



A trunk for a collapsible artificial tree comprising a plurality of pairs of apertures in each of several horizontal planes wherein each pair of apertures is adapted to pivotally support an artificial branch unit. Each pair of apertures of said trunk being spaced apart from each other by the same distance as apertures of other pairs are from each other, but being spaced circumferentially around said trunk from other of said pairs of apertures whereby any branch supported at said several horizontal planes will not be in vertical alignment.

3,713,958

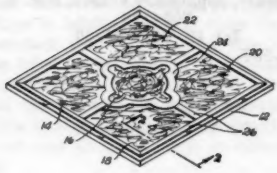
MOCK STAINED-GLASS WINDOW STRUCTURE

Robert S. McCracken, South Pasadena, Calif., assignor to Beagle Manufacturing Company

Filed Mar. 15, 1971, Ser. No. 124,087

Int. Cl. B44c *1/28*; B44l *11/04*; B44d *1/10*

U.S. Cl. 161—18 **4 Claims**



A system is disclosed for producing a mock, lead-joined, stained-glass window structure from a pane of ordinary glass. Pre-formed lead pattern members, including closed pattern members, are affixed to the pane to define closed sections or areas thereon. Layers of color are adhered to one side of the pane within the closed areas to accomplish color patterns and layers of texture composition (resin) are adhered to the opposed side of the pane to provide surface textures for the individual sections.

3,713,959

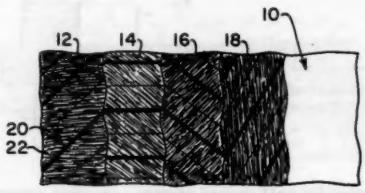
INSENSITIVE THERMAL DISTORTION STRUCTURES

Earl Rottmayer and Robert R. Carman, Tallmadge, and James O. Gibson, Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Aug. 20, 1970, Ser. No. 65,566

Int. Cl. B32b *3/12, 5/12, 19/02*

U.S. Cl. 161—59 **8 Claims**



A structural graphite composite material which has a very low, nearly zero, coefficient of thermal expansion. The material consists of graphite yarns laid up in an epoxy matrix.

3,713,960

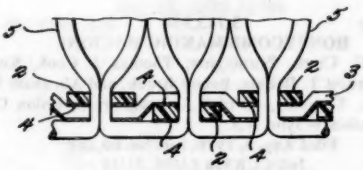
ANTISTATIC TUFTED PRODUCT

William H. Cochran, II, Montauk Avenue, Stonington, Conn.

Continuation-in-part of Ser. No. 765,267, Oct. 4, 1968. This application Oct. 30, 1969, Ser. No. 872,657

Int. Cl. H05f *3/00*

U.S. Cl. 161—66 **5 Claims**



A tufted pile product having antistatic properties including a pile yarn tufted through a backing formed of a non-electrically conductive textile material bonded to an electrically conductive foil.

3,713,961

DIELECTRIC WALL

Robert L. Copeland, Marion, Smyth County, Va.; Bobby G. Gamble, Rockland Acres, Hamblen County, Tenn.; Vance A. Chase, and David R. Beeler, both of Poway, San Diego County, Calif., assignors to Brunswick Corporation, Chicago, Ill., by said Copeland

Filed Oct. 6, 1969, Ser. No. 9,244

Int. Cl. B32b *5/16, 5/28, 27/04*

U.S. Cl. 161—93 **6 Claims**

A thermally set syntactic foam comprising a finally cured polyimide resin having a substantially uniform distribution of high dielectric particles therein. The above-identified syntactic foam is preferably utilized to form a dielectric wall in which the syntactic foam is a second layer and is secured to a first layer composed of a thermally set textile reinforced finally cured polyimide resin. It has been found that better results are obtained if the finally cured polyimide resin comprising the first layer has a void content of less than 5 percent.

3,713,962

COMPOSITE MAT STRUCTURE

Richard H. Ackley, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed March 25, 1970, Ser. No. 22,535
Int. Cl. B32b 5/06
U.S. Cl. 161—154 6 Claims

Fibrous mats comprised of unstranded filaments that are free to move relative to each other and fibrous mats comprised of fibrous strands that are free to move relative to each other, as well as combinations thereof, are impregnated with resin and subsequently molded into resinous products.

3,713,963

DRY MIXTURE OF COPPER SULFATE 8-HYDROXYQUINOLINE SULFATE, AND SULPHURIC ACID AS A PRESERVATIVE ADDITIVE TO A FIBROUS SLURRY PRIOR TO FORMING PAPER THEREFROM

Bror Olof Hager, Djursholm, Sweden, assignor to Hager Aktiebolag, Stockholm S.V., Sweden

Continuation of Ser. No. 720,470, April 11, 1968, abandoned.
This application Nov. 27, 1970, Ser. No. 93,499
Int. Cl. D21h 5/22, 3/00; D21d 3/00
U.S. Cl. 162—161 6 Claims

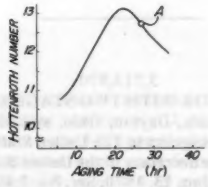
Prior to formation of a paper web the fibrous suspension is treated with a water soluble dry mixture of 1) copper sulfate, 2) a reaction product of 8-hydroxyquinoline with a strong acid (e.g. 8-hydroxyquinoline sulfate), and 3) sulfuric acid (added as a reaction inhibitor for the undissolved components), to form water insoluble copper 8-hydroxyquinoline in situ on the fibers to help preserve the produced paper from destructive organisms. Other components may be useful as the dry mixture including copper sulfate and arsenic acid, with ammonium bicarbonate acting as the reaction inhibitor for the dry components.

3,713,964

METHOD FOR PRODUCING HIGHLY CRIMPED VISCOSE RAYON

Tadao Sasakura, Koriyama, Japan, assignor to Nitto Boseki Co., Ltd., Gonome, Fukushima-shi, Japan

Filed Mar. 9, 1971, Ser. No. 122,388
Claims priority, application Japan, July 21, 1970, 45/63,850
Int. Cl. D01f 3/10, 3/28
U.S. Cl. 161—173 9 Claims



Highly crimped viscose rayon with improved resistance to water is produced by xanthating with 24 to 32% by weight on cellulose of carbon disulfide, adding to thus obtained viscose a combination of modifiers, spinning ripened viscose having a α-value of 49 to 37 and a Hottenroth number within 20 to 10 and corresponds to a point on the descending portion of the Hottenroth number-ripening time curve, said point being within a range where the difference of Hottenroth number at spinning from the Hottenroth number at the peak of said curve is 7 or less.

3,713,965

NON-BLOCKING PACKAGING FILM COMPRISING AN ETHYLENE-VINYL ACETATE COPOLYMER BLENDED WITH A FATTY ACID AMIDE AND CALCIUM CARBONATE

Almar T. Widiger, Midland, and Marvin J. Kreh, Essexville, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,084
Int. Cl. B32b 27/08, 27/18
U.S. Cl. 161—254 6 Claims

A packaging film particularly suited for the shrink-packaging of oxygen-sensitive materials, said film consisting essentially of a first layer of a normally crystalline vinylidene chloride-vinyl chloride copolymer and a second layer of a specified copolymer of ethylene and vinyl acetate having blended therewith at least 1 percent by weight calcium carbonate and at least 3 percent by weight of a fatty acid amide.

ERRATUM

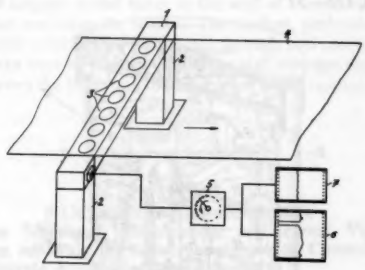
For Class 162—161 see:
Patent No. 3,713,963

3,713,966

APPARATUS FOR ASCERTAINING AND EVALUATING THE TRANSVERSE PROFILE OF THE MOISTURE CONTENT OF MOVED WEBS OF PAPER AND THE LIKE

Paul Lippke, Walter-Rathenau-Strasse 14, 545 Neuwied, Germany

Filed Aug. 20, 1970, Ser. No. 65,377
Claims priority, application Germany, Aug. 21, 1969, P 19 42 529.7
Int. Cl. D21f 7/00; G01n 5/02
U.S. Cl. 162—263 3 Claims



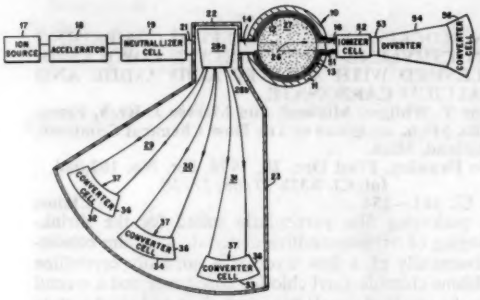
Apparatus for measuring the transverse profile of the moisture content of moving web material, especially paper, according to which individually and at least approximately simultaneously the moisture content at different areas across a moving web material is ascertained, and the thus obtained moisture content of the individual areas across the web to be measured are individually stored and conveyed to indicating means for controlling the moisture content of the respective web material.

3,713,967

ENERGETIC NEUTRAL PARTICLE INJECTION SYSTEM FOR CONTROLLED FUSION REACTOR

Gordon W. Hamilton; Ralph W. Moir, both of Livermore; John E. Osher, Alamo, and Richard F. Post, Walnut Creek, all of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 18, 1971, Ser. No. 154,457
Int. Cl. G21b *1/02*
U.S. Cl. 176—5 7 Claims



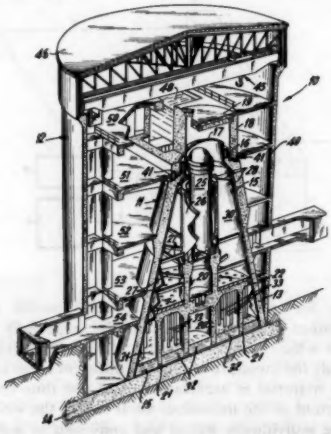
System including an ion source, particle accelerator and neutralizer cell for producing an energetic neutral particle beam which is directed into the containment zone of a controlled fusion reactor. Said beam includes a significant proportion of ionized particles and a proportion of the energetic neutrals are not trapped in the containment zone. Magnetic field means are used to deflect the ionized particles from the neutral particle beam and an ionizer cell is used to ionize neutral particles escaping from said containment zone. Means including spaced arrays of grid structures are arranged to deflect electrons and collect the deflected and reionized particles in a manner adapted to collect and convert the kinetic energy of the particles into electrical energy.

3,713,968

COMPOSITE PRESSURE SUPRESSION CONTAINMENT STRUCTURE FOR NUCLEAR POWER REACTORS

William J. L. Kennedy, Winchester, Mass.; Charles B. Miczek, Braintree, Mass., and George Barabedian, Arlington, Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Oct. 3, 1968, Ser. No. 764,865
Int. Cl. G21c *13/10*
U.S. Cl. 176—37 8 Claims



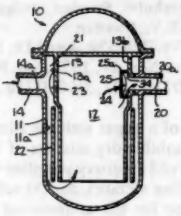
A nuclear power reactor pressure suppression containment system wherein the primary containment includes a biological shielding, vapor barrier and strength member, all of which are constructed and function as a composite structure. A conically shaped concrete pressure vessel internally lined with a gas-impervious membrane comprises the primary containment. A support structure centrally positioned within the primary containment carries the reactor vessel and internal floor independently of the primary containment vessel, the internal floor separating the drywell from the pressure suppression chamber. A secondary containment comprising a cylindrical concrete vessel houses the primary containment vessel and is also supported independently thereof on a common foundation.

3,713,969

EMERGENCY SHUT-OFF VALVE FOR NUCLEAR REACTORS

William J. Cahill, Jr., West Nyack, N.Y., assignor to Consolidated Edison Company of New York, Inc., New York, N.Y.

Filed Sept. 16, 1969, Ser. No. 858,465
Int. Cl. G21c *9/00*
U.S. Cl. 176—38 9 Claims



A nuclear reactor vessel for containing coolant and/or moderator fluid under high pressure and having an emergency shutoff valve mounted adjacent each of its fluid inlet and outlet openings, each valve being arranged to automatically close its associated opening in the event of rupture of the external fluid piping which is attached thereto. The valve disc of each valve has convex, spherical-sector shape, and is mounted by a folded leaf spring and tension pin arrangement to a fixed structure, preferably the reactor core, against which the valve disc is normally held in value-open position. Upon a bursting of the referred to piping, the valve closes in response to the fluid surge forces which are automatically generated by the suddenly changed fluid flow conditions.

3,713,970

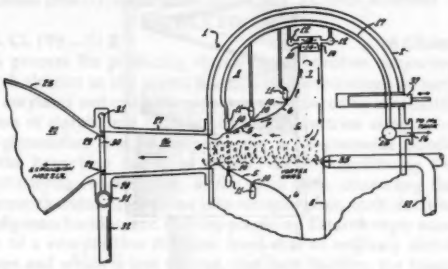
CAVITY REACTOR WITH TWO STAGE SEPARATION

Hans J. P. Von Ohain, Dayton, Ohio, and Melvin R. Keller, Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the United States Air Force

Filed Jan. 13, 1970, Ser. No. 2,598
Int. Cl. G21c *3/44*
U.S. Cl. 176—45 2 Claims

A colloidal gas core nuclear reactor having a high tensile strength outer semispheroidal pressure shell enclosing a

moderator body member which surrounds a central cavity with an expanding nozzle at one end thereof. The greatest cavity radius is at the end remote from the nozzle. Hydrogen gas is supplied to the cavity to provide a vortex fow within the



cavity. A conical duct is provided between the throat of the nozzle and the expansion portion of the nozzle. A groove and particle catcher is provided between the duct and expansion portion of the nozzle. The groove leads to a particle outlet duct.

3,713,971

NUCLEAR REACTOR HAVING A MODULAR CORE

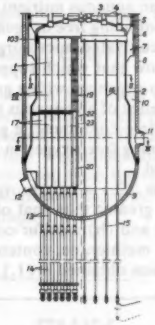
Aart Van Santen, and Bengt Sodergard, both of Vasteras, Sweden, assignors to Allmanna Svenska Electriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 1, 1969, Ser. No. 881,113

Claims priority, application Sweden, Dec. 2, 1968, 16409/68

Int. Cl. G21c *15/00*

U.S. Cl. 176—50 **18 Claims**



A nuclear reactor includes a reactor core and a pressure vessel surrounding the reactor core. A plurality of tubes pass through the bottom part of the vessel and extend towards the core. These tubes have upper ends forming guide tubes for control rods. The core is formed of a plurality of core units each comprising a fuel assembly and a rod movable in one of the control rod guide tubes. The fuel assemblies are substantially polygonal in cross section and are arranged in a polygonal lattice. Each of the fuel assemblies rests on a separate control rod guide tube. The fuel assemblies are arranged close together with at most only a small gap between them and are laterally supported by the adjacent fuel assemblies and the control rod guide tubes.

3,713,972

NUCLEAR REACTOR POWER PLANT

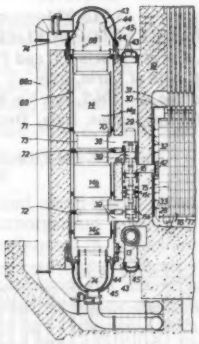
Geoffrey Coast, Sandiway, near Northwich; Kenneth Prince, Bowden; Brian Spruce, Manchester, and Vernon Morgan, Warrington, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed April 22, 1968, Ser. No. 722,929

Claims priority, application Great Britain, May 12, 1967, 20,223/67

Int. Cl. G21d *1/02*

U.S. Cl. 176—60 **2 Claims**



A nuclear reactor power plant, wherein the coolant leaves the core for use in a gas turbine or like heat-to-energy converter, has components disposed in closely spaced parallel vertical elongate sealed bores in the wall of a concrete pressure vessel enclosing the reactor. The coolant, preferably carbon dioxide travels from the reactor through said components back to the core by passageways in the wall between the bores and between the bores and the core space of the reactor.

3,713,973

NUCLEAR FUEL ASSEMBLY

Georges Normand, Ginasservis, and Henri Venobre, Vinon sur Verdon, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 9, 1969, Ser. No. 790,080

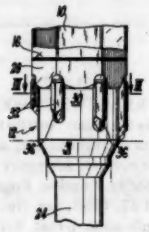
Claims priority, application France, Jan. 31, 1968, 138,161

Int. Cl. G21c *3/32*

U.S. Cl. 176—78 **8 Claims**

A nuclear fuel assembly comprises a central portion having a polygonal cross-section and two end portions. One of the end portions has a smaller cross-section than the central portion and is provided with longitudinal lugs each forming a cam and terminating in a bevelled tip, said lugs being disposed in the line of extension of the

ridges of said polygonal cross-section. Each face of the other end portion is provided with a V-shaped ramp for supporting said bevelled tips and guiding said lugs towards the summits of said polygonal cross-section.



3,713,974

NUCLEAR REACTOR FUEL ELEMENTS

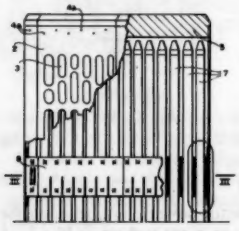
Giuseppe Previti, Corso Francia 62, and Paolo Roncarolo, Via Carlo Vidua 24, both of Turin, Italy

Filed Dec. 10, 1969, Ser. No. 883,721

Claims priority, application Italy, Dec. 20, 1968, 54393 A/68

Int. Cl. G21c *3/34*

U.S. Cl. 176—78 **9 Claims**



A nuclear reactor fuel element has a number of fuel rods arranged in a metallic sheath, the rods being spaced by a number of axially spaced apart grids. Some grids are fixed relative to the sheath while others can slide axially therein, and each fuel rod is frictionally connected to all the slidable grids but to some only of the fixed grids, said fuel rod passing freely through the other fixed grids. The fixed and slidable grids alternate in the central part of the fuel element, and in consequence the loading of the sheath as a result of differential thermal expansion is minimized.

3,713,975

NUCLEAR REACTOR FUEL ELEMENT

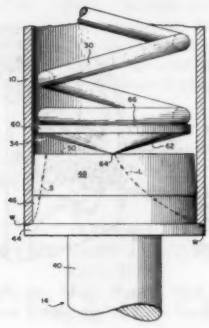
Abraham Katell, Loudonville, N.Y., assignor to NL Industries, Inc., New York, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,492

Int. Cl. G21c *3/18*

U.S. Cl. 176—79 **2 Claims**

A nuclear reactor fuel element includes a tube having end plugs sealing the ends thereof. A body of nuclear fuel is disposed in part of the tube and defines a plenum chamber adjacent one of the end plugs. A plenum compression spring has one end in engagement with a flat disc-like member which engages the body of nuclear fuel. The opposite end of the plenum spring is in engagement with a flat surface formed on a spring seat means including a substantially conical portion which has single point contact with the central part of the inner surface of the adjacent end plug.



3,713,976

CULTIVATION OF MICRO-ORGANISMS ON HYDROCARBONS

Pamela M. Bunting, Cheswick, Pa., and William W. Leathen, Wexford, Pa., assignors to Gulf Research & Development Co., Pittsburgh, Pa.

Filed June 21, 1971, Ser. No. 155,213

Int. Cl. C12c *11/08*

U.S. Cl. 195—28 R **22 Claims**

Protein concentrates are obtained in a process which includes:

1. Cultivating a hydrocarbon-consuming micro-organism in the presence of an aqueous nutrient medium, a hydrocarbon and a gas containing free oxygen;
2. contacting the cultivated micro-organism from (1.) at a temperature below that which supports active fermentation of the micro-organism with a gas containing free oxygen in the presence of an aqueous nutrient medium containing a thiosulfate compound, e.g., sodium thiosulfate, and a gas containing free oxygen in the absence of added hydrocarbon; and
3. recovering from (2.) a micro-organism having (a) a protein content greater than that of the micro-organism obtained in (1.) and (b) a sulfur-containing amino acid, e.g., cystine and methionine, content greater than that of the micro-organism obtained in (1.).

3,713,977

PROCESS FOR PRODUCING L-HISTIDINE

Kiyoshi Nakayama, Sagamihara, and Kazumi Araki, Tokyo, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd.

Filed Jan. 7, 1971, Ser. No. 104,772

Claims priority, application Japan, Jan. 22, 1970, 45/5389

Int. Cl. C12d *13/06*

U.S. Cl. 195—29 **7 Claims**

L-histidine is produced by fermentation of an aqueous nutrient media with organisms of the genera Brevibacterium, Corynebacterium, Arthrobacter, Microbacterium, Micrococcus, Bacillus, Nocardia, and Azotobacter which organisms are resistant to analogues of L-histidine.

3,713,978

PROCESS FOR PREPARING POWDERY STARCH SUGARS

Masashi Kurimoto, Okayama-shi, and Mamoru Hirao, Okayama, both of Japan, assignors to Hayashibara Company, Okayama-shi, Okayama, Japan

Filed Nov. 19, 1969, Ser. No. 878,238
Claims priority, application Japan, Nov. 22, 1968, 43/85844
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 R 6 Claims

A process for producing starch sugars involves subjecting starch slurries to the action of acids or combinations of various amylases and converting dextrins, produced by saccharification of starch, into straight-chain malt dextrins using an α-1,6-glucosidase that decomposes the α-1,6-glucoside bonds, or the branching bonds of starch, thereby facilitating the saccharifying reaction and, at the same time, converting the oligosaccharides or dextrins into straight-chain malt dextrins or oligosaccharides, and thereby preparing a starch sugar solution of a composition different from that of ordinary starch syrups and which is less viscous, and then finishing the liquor easily by spray drying to a powdery product.

3,713,979

PRODUCTION OF MANNANS BY FERMENTATION

Morey E. Slodki, Peoria; Millie Jo Smiley, Morton, and Dwight E. Hensley, Peoria, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture

Filed May 28, 1971, Ser. No. 148,131
Int. Cl. C12d *1/00*
U.S. Cl. 195—31 P 17 Claims

Mannan polymers are produced extracellularly by yeast previously known to produce only phosphomannans. Hydrolysis of the polymers with a mineral acid catalyst results in substantially pure D-mannose.

3,713,980

PROCESS FOR THE PREPARATION OF PERUVOSIDE

Gunter Balsam, and Otto Kufner, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Nov. 24, 1970, Ser. No. 92,177
Claims priority, application Germany, Nov. 25, 1969, P 19 59 039.7
Int. Cl. C12b *1/00*
U.S. Cl. 195—32 9 Claims

Peruvoside is obtained in high yield employing a greasy vegetable source of peruvoside, e.g., the fruit or seeds of *Apocynacea Thevetia peruviana*, for the fermentation step which releases glycosides from vegetable sources thereof. The glycosides are then extracted from the fermentation product and the peruvoside is separated from the extracted glycoside mixture by chromatography.

3,713,981

ENZYMES FROM ARMILLARIA MELLEA

Douglas Broadbent, Alderley Edge, Cheshire; Ralph William Turner, Cheadle, Cheshire, and Peter Leslie Walton, Knutsford, Cheshire, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 31, 1970, Ser. No. 68,501
Claims priority, application Great Britain, Sept. 26, 1969, 47,554/69; May 7, 1970, 22,129/70
Int. Cl. C12d *13/10*; A61k *19/00*
U.S. Cl. 195—62 4 Claims

An enzymic substance, AM protease, having fibrinogenolytic, fibrinolytic and anticoagulant activity. Processes for preparing AM protease. Pharmaceutical compositions containing AM protease.

3,713,982

ENZYME CHEMICALLY COUPLED TO CELLULOSE ETHER

Antohny Nicholas Emery, Birmingham, Warwickshire, England, assignor to Ranks Hovis McDougall Limited, London, England

Filed March 17, 1970, Ser. No. 20,389
Claims priority, application Great Britain, Dec. 11, 1969, 60,474/69
Int. Cl. C07g *7/02*; C12n *1/00*
U.S. Cl. 195—63 6 Claims

A process for the preparation of a water insoluble papain which process comprises reacting at 0°–3°C. the papain dissolved in a buffer within a pH range of 6.5–8.5 and containing L-cysteine and diaminoethane tetra-acetic acid with the p-diazophenoxy hydroxypropyl ether of cellulose.

3,713,983

METHOD FOR PREPARING A THERMOSTABLE AND ALKALI-STABLE PROTEASE

Tamotsu Yokotsuka, Nagareyama, and Takashi Iwaasa and Mituharu Fujii, Noda, Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda-shi, Japan

No Drawing. Filed July 6, 1970, Ser. No. 52,685
Int. Cl. C12d *13/10*
U.S. Cl. 195—66 R 4 Claims

A thermostable and alkali-stable protease is prepared by culturing a microorganism belonging to the species *Thermopolyspora polyspora* in a medium at a temperature of 40° to 55° C. aerobically thereby to accumulate the protease in the medium and recovering the protease from the cultured medium. After the completion of the cultivation, mycelia are removed from the cultured medium by centrifuge, filtration or the like method, and the preparations of the thermostable and alkali-stable protease are obtained from the filtrate or the concentrated filtrate by the ordinary enzyme purification method such as salting out, dialysis, or the like. The thermostable and alkali-stable protease is useful for the food industry, fermentation industry, animal feed industry and pharmaceutical industry.

3,713,984

CULTIVATION OF MICRO-ORGANISMS ON HYDROCARBONS

Pamela M. Bunting, Cheswick, Pa., and William W. Leathen, Wexford, Pa., assignors to Gulf Research & Development Co., Pittsburgh, Pa.

Filed June 21, 1971, Ser. No. 155,275
Int. Cl. C12b *1/00*; C12c *1/00*
U.S. Cl. 195—82 19 Claims

Protein concentrates are obtained in a process which includes:

1. Cultivating a hydrocarbon-consuming micro-organism in the presence of an aqueous nutrient medium, a hydrocarbon and a gas containing free oxygen;

2. contacting the cultivated micro-organism from "1" at a temperature below that which supports active fermentation of the micro-organism with a gas containing free oxygen in the presence of an aqueous nutrient medium containing diphenyl disulfide and a gas containing free oxygen in the absence of added hydrocarbon; and

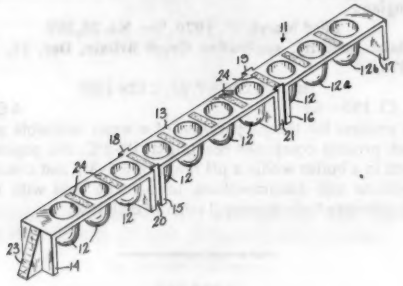
3. recovering from "2" a micro-organism having a sulfur-containing amino acid, e.g., cystine and methionine, content greater than that of the micro-organism obtained in "1."

3,713,985

DEVICE AND METHOD FOR TESTING POTENCY OF BIOLOGICAL CONTROL REAGENTS

Thomas W. Astle, Orange, Conn., assignor to Fred S. Kantor, Orange, Conn.

Filed Oct. 19, 1970, Ser. No. 81,781
Int. Cl. C12k 1/04
U.S. Cl. 195—103.5 R 20 Claims



Device for testing the potency of a biological control reagent, as in antibiotic susceptibility testing, especially the determination of minimum inhibitory concentration, comprising a strip of a plurality of interconnected plastic cups having a capacity of about 0.3 ml. each. All but two of the cups contain a range of amounts of the control reagent in an essentially dry state which will provide a predetermined range of concentrations when the reagent is redispersed. Contamination of the dry reagent in the cups is prevented by an adherent plastic film or aluminum foil across the openings of the cups. In use, the adherent film or foil is removed, the dry reagent is redispersed to form the required range of concentrations, and all of the cups except one are inoculated with the biological material against which the potency of the control reagent is to be tested. The last cup contains the dispersion medium but not the control reagent nor inoculum, and provides a sterility control. The second last cup contains the dispersion medium and the inoculum, and serves as a growth control. The strip of cups is then resealed, incubated, and the test results are read.

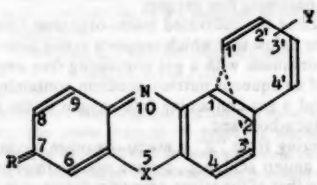
3,713,986

INDICATOR FOR THE DETERMINATION OF REDUCED PYRIDINE COENZYMES

Hans Ulrich Bergmeyer, Erich Haid, and Michael Nelboeck-Hochstetter, Tutzing, Upper Bavaria, and Gunter Weimann, Percha, Germany, assignors to Boehringer Mannheim GmbH, Postfach, Germany

No Drawing. Filed Nov. 17, 1970, Ser. No. 90,467
Claims priority, application Germany, Nov. 26, 1969, P 19 59 410.6
Int. Cl. C12k 1/04
U.S. Cl. 195—103.5 R 18 Claims

Reduced pyridine coenzymes, such as nicotinamide-adenine-dinucleotide (NADH) and nicotinamide-adenine-dinucleotide phosphate (NADPH), are conveniently determined colorimetrically with a stable and inherently color-producing indicator comprising a benzophenoxazine or benzophenothiazine compound of the formula:



wherein R is oxygen or the group

in which R_1 and R_2 are hydrogen or lower alkyl of from 1 to 6 carbon atoms; X is sulfur or oxygen; and Y is hydrogen or hydroxyl.

3,713,987

APPARATUS FOR RECOVERING MATTER ADHERED TO A HOST SURFACE

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration, with respect to an invention of William W. Paik, Newport News, Va., and Carl P. Chapman, La Crescenta, Calif.

Filed Oct. 7, 1970, Ser. No. 78,703
Int. Cl. C12k 1/10
U.S. Cl. 195—127 3 Claims

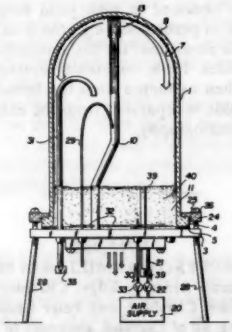
An apparatus particularly suited for recovering matter adhered to a host surface. The apparatus is characterized by a pickup head having an ultrasonic transducer adapted to deliver ultrasonic pressure waves to impinge against matter adhered to the surface for thus agitating the matter to effect its separation from the surface, and an integrally related vacuum system which serves to recover the separated matter and deliver such matter to a catch basin wherein the matter is entrapped to be recovered for examination and/or disposal.

3,713,988

NON-RAMIFIED CULTURE GROWING APPARATUS

Peter S. S. Dawson; Wolfgang G. W. Kurz; Moffat Anderson, and Arthur E. York, all of Saskatoon, Saskatchewan, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed March 8, 1971, Ser. No. 121,694
Claims priority, application Canada, May 8, 1970, 082,268
Int. Cl. C12b 1/00
U.S. Cl. 195—143 9 Claims

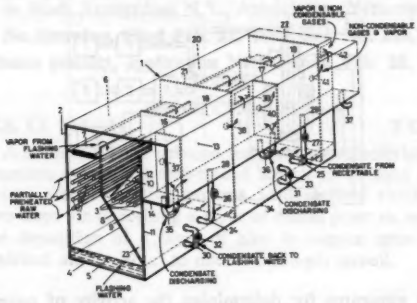


A non-ramified culture growing apparatus wherein an inner domed surface of a glass bell-jar provides a culture draining surface, and culture is circulated by a fluid operated, diaphragm pump from a lower portion of the bell-jar along a pipe to be sprayed on to the draining surface by a nozzle.

ERRATUM

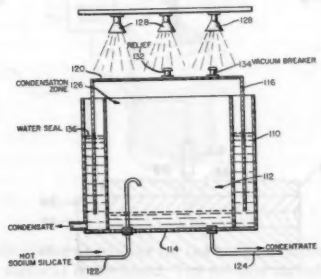
For Class 196—139 see:
Patent No. 3,713,615

3,713,989
FLASH EVAPORATOR
Pieter Robert Bom, Willem de Zwijgerlaan 37, Santpoort, Netherlands
Filed Mar. 5, 1970, Ser. No. 16,657
Int. Cl. B01d *3/02*
U.S. Cl. 202—173 13 Claims



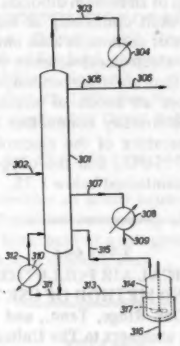
A flash evaporator has a plurality of chambers connected in series and in parallel, which among other things, makes it possible to put one chamber out of operation for maintenance and repairs without interrupting the process.

3,713,990
APPARATUS FOR LIQUID SEPARATION BY FLASH DISTILLATION
Frank J. Lazet, Media, Pa., assignor to Philadelphia Quartz Company, Philadelphia, Pa.
Filed Jan. 29, 1971, Ser. No. 110,886
Int. Cl. B01d *3/00*; F28b
U.S. Cl. 202—185 2 Claims



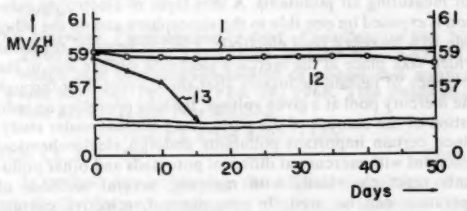
This invention relates to an apparatus for effecting the separation of a more readily vaporizable component, such as water, from a multi-component fluid stream by providing a flash vaporization section and a means for condensing the vapors released during the vaporization without contaminating the atmosphere, and thus avoiding a possible air pollution problem.

3,713,991
RECOVERY OF DIMETHYLFORMAMIDE BY CRYSTALLIZATION AND DISTILLATION
Brian Edward Alston Thomas, Wilmslow, Cheshire SK 92 JY, England, assignor to Porvair Limited, Norfolk, England
Filed May 27, 1970, Ser. No. 40,846
Claims priority, application Great Britain, May 28, 1969, 26985/69; Aug. 21, 1969, 41832/69
Int. Cl. C07c *103/36*; B01d *9/00*
U.S. Cl. 203—48 5 Claims



Solvent recovery process and apparatus for separating pure dimethylformamide from admixture with sodium chloride and water using a first stage of partial evaporation producing salt crystallization and separation and a second stage of fractional distillation using a high volume bottom products flow.

3,713,992
GLASS ELECTRODE FOR DETERMINING PH VALUE AT SUPER HIGH TEMPERATURES
Tsugio Akazawa, 18-17, Takaido-Nishi 1-chome, Suginami-ku, Tokyo, Japan
Filed March 11, 1970, Ser. No. 18,496
Claims priority, application Japan, March 15, 1969, 44/19255
Int. Cl. G01n *27/36*
U.S. Cl. 204—1 T 6 Claims



A glass electrode used for determining pH-values particularly at elevated temperatures, the active part of which is formed of a glass membrane composed of a glass that comprises as essential constituents 50–70 percent SiO_2, 10–20 percent Li_2O, 7–20 percent BaO, and 3–10 percent UO_3, and also

0–5 percent of an oxide or oxides selected from the group consisting of NiO, Nd_2O_3, La_2O_3, Cr_2O_3, ThO_2, ZrO_2, TiO_2, MnO_2, Co_3O_4, Ta_2O_5, and Nb_2O_5.

3,713,993

ELECTRODEPOSITION OF ZIRCONIUM DIBORIDE

Geoffrey W. Mellors, Strongsville, and Seymour Senderoff, Fairview Park, both of Ohio, assignors to Union Carbide Corp., New York, N.Y.

Filed June 8, 1970, Ser. No. 44,651
Int. Cl. C23b 7/00; B01k 1/00
U.S. Cl. 204—3 15 Claims

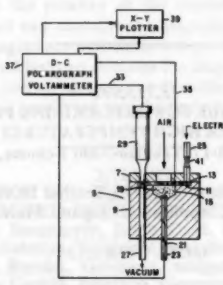
Coherent coatings of zirconium diboride are deposited electrolytically from a melt containing at least one fluoride of potassium, rubidium or cesium, at least one fluoride of an element higher in the electromotive series than zirconium and boron, at least one fluoride of zirconium, and boron trioxide. The process employs an anode of zirconium or zirconium diboride, and an electrically conductive base material as a cathode. The temperature of the electrolytic melt is maintained in excess of 750°C., and the oxygen to boron molar ratio in the melt is maintained below 1.75.

3,713,994

ELECTROCHEMICAL AIR POLLUTION MONITORING DEVICE AND METHOD OF USE THEREOF

Wilbur D. Shults, Oak Ridge, Tenn., and John R. Kuempel, Greencastle, Ind., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed March 16, 1971, Ser. No. 124,697
Int. Cl. G01n 27/42
U.S. Cl. 204—1 T 8 Claims



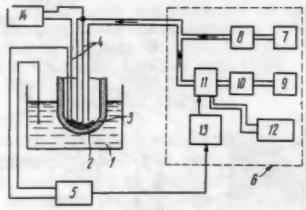
An electrochemical monitoring device has been provided for measuring air pollutants. A thin layer of electrolyte solution is exposed on one side to the atmosphere and on the other side to a mercury pool electrode. Electrochemical reactions which take place at the mercury electrode surface due to the presence of certain pollutants alter the current flow through the mercury pool at a given voltage, thereby providing an indication of the amount of the particular pollutant under study. Since certain important pollutants undergo electrochemical reactions with mercury at different potentials and other pollutants react chemically with mercury, several methods of operation can be used. In one method, selective current responses are obtained for the detection and determination of different pollutants by varying the mercury electrode potential. In a second method, the products of chemical or electrochemical reaction are accumulated in the thin layer of solution or at the electrode surface, and are periodically determined by current coulometric measurement. These two methods can be used jointly and supplement each other.

3,713,995

METHOD FOR DETERMINING ACTIVITY OF OXYGEN IN LIQUID AND SOLID METALS AND ALLOYS

Petr Alexeevich Cherkasov, Balashikhinskogo raiona 3, liniya 45, Poselok Nikolskoe Moskovskoi Oblasti, U.S.S.R.; and Evgeny Mikhailovich Kuznetsov, Lomonosovsky prospekt 14, kv. 340; Vyacheslav Vasilievich Averin, ulitsa Vavilova 44, korpus 4, kv. 214; and Alexandr Mikhailovich Samarin, Leninsky prospekt 13, kv. 48, all of Moscow, U.S.S.R.

Filed Dec. 12, 1969, Ser. No. 884,582
Int. Cl. G01n 27/46
U.S. Cl. 204—1 T 3 Claims



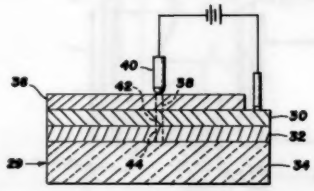
An apparatus for determining the activity of oxygen in a liquid and solid metal and alloys which includes a control for the partial pressure of oxygen in a reference electrode, which latter electrode is one of a pair of electrodes of an oxygen concentration cell. When the electromotive force across the pair of electrodes of the cell varies from a zero value, the control adjusts the partial pressure of oxygen in the reference electrode to a value corresponding to the oxygen activity of the metal or alloy being tested, this metal or alloy forming the other of the pair of electrodes of the oxygen concentration cell.

3,713,996

ELECTROSENSITIVE RECORDING MEDIA

Eugene C. Letter, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 791,920, Jan. 17, 1969, abandoned. This application Jan. 6, 1971, Ser. No. 104,513
Int. Cl. C23c 13/00; B41m 5/20; G03g 17/00
U.S. Cl. 204—2 6 Claims



Electrosensitive recording media comprising a base of insulating sheet material such as paper, a reflective metallic film supported on the base, and a solid state electrolyte constituted by a base metal halide in a very finely divided, practically continuous layer adherently covering the metallic film. The metal and the electrolyte are selected from among those that will

react with each other in the dry state when they are electrolyzed. Marks are made by passing currents from a stylus through the electrolyte to the metallic film, causing a reaction to occur locally between the electrolyte and the metal to produce a colloidal metallic precipitate that appears dark against the reflective background of the film.

3,713,997

METHOD FOR THE GALVANO TECHNICAL MANUFACTURE OF CYLINDRICAL THIN-WALLED SCREEN STENCILS FOR THE ROTARY SCREEN PRINTING PROCESS

Lodewijk Anselrode, Sint Anthonis, Netherlands, assignor to Stork Amsterdam N.V., Amstelveen, Netherlands

No Drawing. Filed Feb. 22, 1971, Ser. No. 116,718

Claims priority, application Netherlands, Feb. 20, 1970, 7002467

Int. Cl. C23b 7/02

U.S. Cl. 204—11 2 Claims

A method for the galvano technical manufacturing of a seamless cylindrical thin-walled stencil to be used in the rotary screen printing process, said method comprising two steps viz depositing a layer of nickel prior to, or after the deposition of a layer of zinc or copper upon a cylindrical matrix, so as to obtain a two-ply stencil.

3,713,998

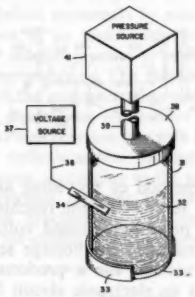
METHOD OF AND APPARATUS FOR THE ELECTROCHEMICAL TREATMENT OF WORK SURFACES

John Thomas Kenney, Lawrence Township, Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 23, 1970, Ser. No. 83,474

Int. Cl. C23b 5/48; B23p 1/02

U.S. Cl. 204—15 14 Claims



A method and apparatus for the electrochemical treatment of work surfaces is disclosed. The method includes placing an electrolytic solution in contact with a suitable membrane. The solution passes through the membrane in a first direction to contact the work surface to be treated. A current is passed through the solution and the workpiece to polarize the ions contained in the solution and to initiate an electrochemical reaction between the work surface and a first portion of the polarized ions, electrochemically reactive with the work surface. A second portion of the polarized ions, non-reactive electrochemically with the work surface passes through the membrane in a second direction, opposite the first direction, to assure a relatively rapid and uniform rate of electrochemical treatment. The apparatus comprises a container for the electrolytic solution to which is affixed the membrane, which acts as a dispensing member for the solution, and a voltage source for passing current through the solution and the work surface. A vibrator and/or pressure applier may be associated with the container to increase the dispensing rate of the solution through the membrane.

3,713,999

ELECTRODEPOSITION OF CHROMIUM

Malcolm John Law, Dorking, and Horace Jones, Catshill, Bromsgrove, both of England, assignors to Permalite Chemicals Limited, Middlesex, England

Filed Oct. 12, 1970, Ser. No. 80,220

Claims priority, application Great Britain, Oct. 10, 1969, 49,802/69

Int. Cl. C23b 5/06, 5/48

U.S. Cl. 204—51 10 Claims

The invention provides an acidic aqueous solution for electrodeposition of chromium comprising chromic acid (CrO_3), at least 2 grams of boric acid or a salt giving rise to borate ions per liter of solution, and sulphate ions.

3,714,000

INTEGRAL COLOR ANODIZING OF ALUMINUM

Geoffrey A. Dorsey, Jr., Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

No Drawing. Filed Nov. 29, 1971, Ser. No. 203,024

Int. Cl. C23b 9/02

U.S. Cl. 204—58 3 Claims

A method of integral color anodizing of aluminum comprising subjecting the aluminum as the anode to electrolysis in an aqueous electrolyte having a pH between 0.5 and 2.0 and containing compounds capable of complexing with the aluminum which dissolves in solution during anodizing. The electrolyte is preferably acidified with small amounts of sulfuric acid, oxalic acid, and the like.

3,714,001

METHOD FOR FORMING ANODIC OXIDE COATINGS HAVING IMPROVED ADHESIVE PROPERTIES

Geoffrey A. Dorsey, Jr., Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

No Drawing. Continuation-in-part of application Ser. No. 22,022, Mar. 23, 1970, now Patent No. 3,672,972, which is a continuation-in-part of abandoned application Ser. No. 707,962, Feb. 26, 1968. This application Jan. 31, 1972, Ser. No. 222,383

Int. Cl. C23f 9/02, 17/00

U.S. Cl. 204—58 7 Claims

A method for improving the adhesive qualities of an anodically formed coating on aluminum substrate comprising subjecting an aluminum article to a current density of from 20 to 75 amps/ft.^{2} for a period of from one second to one minute in an electrolyte selected from the group consisting of an aqueous solution of oxalic acid and an aqueous solution of phosphoric acid, said solutions containing more than 10 grams/liter of aluminum. The process forms pseudoboehmite on an anodic

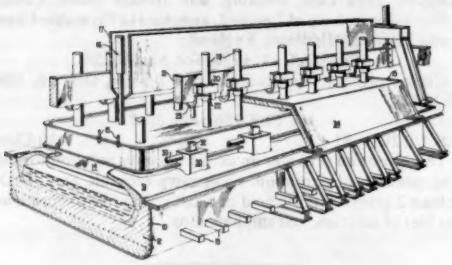
oxide coating which provides the improved adhesive qualities.

3,714,002

ALUMINA REDUCTION CELL AND IMPROVED ANODE SYSTEM THEREIN

Robert M. Kibby, Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sept. 2, 1970, Ser. No. 68,939
Int. Cl. C22d *3/12, 3/02*
U.S. Cl. 204—67 **24 Claims**



Improvements in the construction and operation of alumina reduction cells, particularly as regards procedures and equipment for feeding alumina into the bath of such a cell and for collecting and removing anode reaction gases.

3,714,003

PROCESS FOR THE PRODUCTION OF ARYL CARBOXYLIC ACIDS

Robert M. Engelbrecht, deceased, late of St. Louis, Mo. (by Alice M. Engelbrecht, executrix); James C. Hill, Chesterfield, Mo., and Richard N. Moore, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed June 29, 1970, Ser. No. 50,929
Int. Cl. C07c *51/40, 63/02, 63/26*
U.S. Cl. 204—78 **6 Claims**

Aryl carboxylic acids are produced from alkyl substituted aryl compounds or partially oxidized alkyl substituted aryl compounds in an electrolytic cell with a lead containing anode and using chromium in an ionized state in mineral acid as a carrier for electrons. The process is particularly useful in the oxidation of p-toluic acid to terephthalic acid and of tetraalkyl benzene to tetracarboxylic acids. Both terephthalic acid and tetracarboxylic acids are useful in the production of polyester resins. Trimetallic acid used in making trimellitate plasticizers for polyvinyl chloride resins may also be produced by this process.

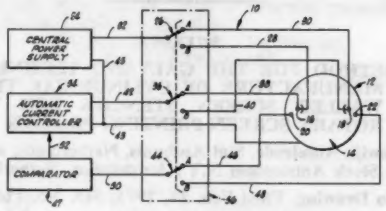
3,714,004

METHOD AND APPARATUS FOR CATHODIC PROTECTION

Olen L. Riggs, Jr., Houston, and David W. Barnett, Chute, both of Tex., assignors to Continental Oil Company, Ponca City, Okla.

Filed Dec. 2, 1970, Ser. No. 94,353
Int. Cl. C23f *13/00*
U.S. Cl. 204—147 **7 Claims**

An improved apparatus and method for cathodically protecting surfaces exposed to a corrosive environment utilizing a predetermined number of anodes, each anode being connected to a power source adapted to supply a predetermined polarizing current thereto, and each anode being connected to a current controller adapted to supply an adjustingly, controlled polarizing current thereto. The polarizing current supplied by the current controller to any one anode is adjustingly controlled in response to the anode potential of that one anode with respect to the protected surface, the cathodic protection system being adapted to sequentially provide electrical continuity between each anode and the current controller and between the remaining anodes and the power source in such a manner that polarization of the system is obtained and maintained utilizing a minimum overall power consumption and in a manner maintaining a predetermined polarization over substantially the entire area of the protected surface.

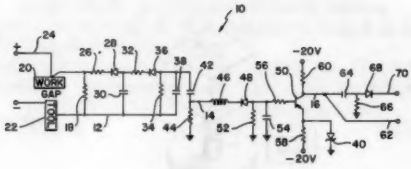


3,714,005

PERCENTAGE OF MAXIMUM CURRENT AND THRESHOLD VOLTAGE RESPONSIVE ELECTRONIC CONTROL CIRCUIT AND METHOD

Robert W. Drushel, 31905 Nottingwood, Farmington, Mich.

Application Nov. 18, 1966, Ser. No. 595,442, now Patent No. 3,564,528, which is a continuation-in-part of applications Ser. No. 573,999, Aug. 22, 1966, now Patent No. 3,508,115, Ser. No. 583,875, Oct. 3, 1966, now Patent No. 3,591,851, Ser. No. 585,395, Oct. 10, 1966, now Patent No. 3,521,083, and Ser. No. 595,189, Nov. 17, 1966, now Patent No. 3,471,750. Divided and this application Feb. 16, 1971, Ser. No. 115,668
Int. Cl. B01k *3/00;* **B23p** *1/02*
U.S. Cl. 204—129.2 **10 Claims**



Structure for and method of providing an output signal in response to a sensed current reaching a percent of maximum current prior to a sensed voltage reaching a threshold voltage and after the voltage sensed returns below the threshold voltage for a predetermined time. The structure includes an electronic circuit for sensing a percentage of maximum current in an electroerosion machining circuit and providing an output signal in response thereto, a circuit for sensing the voltage across the gap in the electroerosion machining circuit and providing an output any time the voltage sensed is above a threshold voltage level or returns below the threshold voltage level for a predetermined time, an output circuit for providing an output in response to an input signal thereto, a gate circuit connected between the current sensing circuit and the output circuit for permitting passage of an output signal from the current sensing circuit to the input of the output circuit only when the gate circuit is open and a gate control circuit for closing the

gate circuit in response to an output signal from the voltage sensing circuit.

3,714,006

CYCLOPENTADIENYLMANGANESE TRICARBONYL COMPOUNDS AS A CATALYST FOR THE RADIATION CURING OF POLYEPOXIDES

William S. Anderson, 6408 Irwin Court, Oakland, Calif.

Division of Ser. No. 98,180, Dec. 14, 1970. This application May 15, 1972, Ser. No. 253,248

Int. Cl. B01j 1/10, 1/12

U.S. Cl. 204—159.14 9 Claims

The cure of polyepoxide resins with a reactive acid anhydride or polymercaptan curing agent is accelerated in the presence of light and a catalytic amount of a cyclopentadienylmanganese tricarbonyl compound, e.g., methylcyclopentadienylmanganese tricarbonyl.

3,714,007

PROCESS FOR PHOTOPOLYMERIZING UNSATURATED POLYESTER RESINS IN CONTACT WITH IMMISCIBLE LIQUIDS

Philippe Borrel, and Jean Lehureau, both of Lyon, France, assignors to Progil, Paris, France

Filed Dec. 1, 1970, Ser. No. 94,159

Claims priority, application France, Dec. 17, 1969, 6943624

Int. Cl. C08d 1/00; C08f 1/16

U.S. Cl. 204—159.15 3 Claims

Photopolymerization of unsaturated polyester resins is carried out by submerging the resin beneath a clear liquid which provides a better heat balance.

3,714,008

INHIBITORS FOR AQUEOUS PHASE, RADIATION POLYMERIZATION

Masaaki Takehisa, and Shiro Senrui, both of Takasaki-shi, Japan, assignors to Japan Atomic Energy Research Institute, Minato-ku, Tokyo, Japan

Filed May 12, 1970, Ser. No. 36,682

Int. Cl. C08d 1/00; C08f 1/16

U.S. Cl. 204—159.22 7 Claims

In the polymerization, in which an aqueous phase is employed, of ethylene, or ethylene and other unsubstituted or substituted olefinic monomers by means of an ionizing radiation, formation of an undesirable polymer in the aqueous phase of the reaction system is inhibited by using specific polymerization inhibitors. The inhibitors which have no adverse effect on the polymerization in the non-aqueous phase, comprise the electrolytes which have strong oxidizing action and/or react at high reaction rate with active species such as H radicals, OH radicals and/or hydrated electrons formed by ionizing radiation. According to the present invention, adhesion of undesirable polymer to the reactor walls during polymerization reaction is prevented and contamination which lowers the quality of the main polymer is eliminated.

3,714,009

PROCESS FOR THE PREPARATION OF TERTIARY PHOSPHINE OXIDES USING HIGH ENERGY RADIATION

Hans-Jerg Kleiner, Bad Soden/Taunus, and Sigurd Rossinger, Frankfurt am Main, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed March 4, 1970, Ser. No. 16,604

Claims priority, application Germany, March 13, 1969, P 19 12 708.3

Int. Cl. B01j 1/10

U.S. Cl. 204—162 HE 4 Claims

Improved process for the preparation of tertiary phosphine oxides by reacting dialkyl phosphine oxides with α-olefins, wherein the reaction is carried out in the presence of high-energy radiation. In comparison with known processes the tertiary phosphine oxides are obtained according to the instant process within a shorter reaction time, with higher purity and with higher yields. The reaction products can be used as intermediates, surfactants, detergents and cleaning agents, especially in cosmetic products.

3,714,010

PREPARATION OF ANION EXCHANGE MEMBRANES FROM CELLULOSIC SHEETS

Adalbert Siiszer, Jerusalem, Israel, assignor to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Jan. 6, 1972, Ser. No. 217,706

Int. Cl. B01d 13/02

U.S. Cl. 204—180 P 22 Claims

Anion exchange membranes can be prepared from cellulosic sheet materials such as cellophane, parchment paper, or kraft paper by impregnating the sheet with polyethyleneimine. The membrane is cross-linked at a temperature from 10 to 50° C., with a reagent selected from the group of monaldehydes, dialdehydes, reactive methylol compounds and mixtures thereof. The membrane is then quaternized. It is particularly suited for use in the electrodialytic purification of saline water.

3,714,011

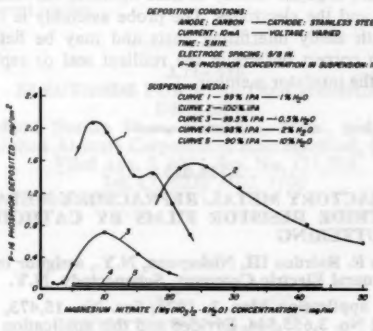
METHOD OF ELECTROPHORETIC DEPOSITION OF CATHODOLUMINESCENT MATERIALS

Patrick F. Grosso, Stamford; Robert E. Rutherford, Jr., New Canaan, both of Conn., and Donald E. Sargent, Schnectady, N.Y., assignors to Columbia Broadcasting System, Inc.

Continuation-in-part of Ser. No. 792,575, Jan. 21, 1969, Pat. No. 3,551,306. This application July 17, 1970, Ser. No. 55,777

Int. Cl. B01k 5/02; C23b 13/00

U.S. Cl. 204—181 5 Claims

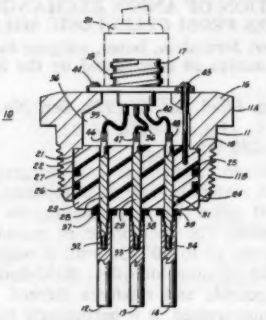

DEPOSITION CONDITIONS:
ANODE: CARBON —CATHODE: STAINLESS STEEL
CURRENT: 10mA —VOLTAGE: VARIED
TIME: 5 MIN.
ELECTRODE SPACING: 5/8 IN.
P-46 PHOSPHOR CONCENTRATION IN SUSPENSION: 1mg/ml
SUSPENDING MEDIA:
CURVE 1 — 99 % IPA — 1% H2O
CURVE 2 — 100 % IPA
CURVE 3 — 99.5 % IPA — 0.5% H2O
CURVE 4 — 98 % IPA — 2% H2O
CURVE 5 — 90 % IPA — 10% H2O
P-46 PHOSPHOR DEPOSITED - mg/cm²
MAGNESIUM NITRATE (Mg(NO3)2 · 6H2O) CONCENTRATION — mg/ml

An electrodeposition process for the cataphoretic deposition of cathodoluminescent materials to produce a film cemented to a substrate surface with the oxide or hydroxide of a soluble metal salt. The film is formed by electrolyzing a suspension of the luminescent material in a quiescent solution of a soluble salt of the corresponding metal in an organic solvent miscible with water containing from about 0.01 to about 1 percent water by volume, a cathodic depolarizing agent, and having an electrolyte concentration in the order of 0.5–25 mg/ml.

3,714,012
CORROSION TEST PROBE ASSEMBLY

Francis H. Herron, deceased, by Rosa C. Herron, executrix, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 18, 1971, Ser. No. 200,083
Int. Cl. G01n 27/30
U.S. Cl. 204—195 C 10 Claims



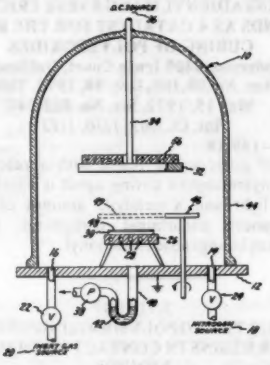
A corrosion test proble assembly formed of a pipe-plug base, a cylindrical insulator member and metallic electrodes. The rigid insulator member is slideably positioned in a cylindrical passageway and secured in longitudinal inward engagement with a shoulder in the body. Electrical conductors are secured in the member and extend from one end into a cavity in the body to connect by flexible leads to an external circuit connector and from the other end to receive, by threaded interconnection, metallic electrodes which can be immersed within a corrodant. A resilient annular seal resides in a circumferential groove in the member and forms a fluid-tight seal between the member and the body. Insulating fluid seals about the conductors are engaged axially in fluid-tightness between the member and the electrodes. The probe assembly is fabricated with easily interfitting parts and may be field-repaired to correct defects in the resilient seal or replacement of the insulator member.

3,714,013
REFRACTORY METAL/REFRACTORY METAL NITRIDE RESISTOR FILMS BY CATHODE SPUTTERING

John R. Rairden III, Niskayuna, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Original application Mar. 2, 1970, Ser. No. 15,473, now Patent No. 3,655,544. Divided and this application Oct. 29, 1971, Ser. No. 194,037
Int. Cl. C23c 15/00
U.S. Cl. 204—192 5 Claims

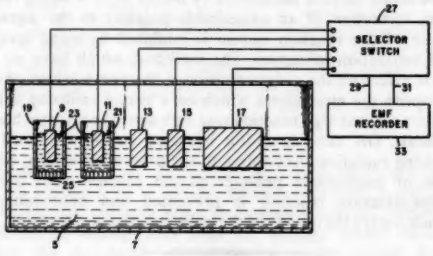
Low temperature coefficient of resistance, high resistivity films of a refractory metal/refractory metal nitride are formed by sputtering a tungsten or molybdenum cathode in a chamber containing a mixture of an inert gas and nitrogen wherein nitrogen forms between 0.3 and 3.0% of the sputtering chamber pressure. The deposited films characteristically are a mixture of the sputtered metal and at least 5% by volume of the metal nitride with films having especially superior electrical characteristics containing the metal nitride in concentrations between approximately 40 and 60% by volume of the resistor film.



3,714,014
ELECTROCHEMICAL APPARATUS FOR DETERMINATION OF MOLTEN SALT COMPOSITION

Karl A. Romberger, Weatherly, Pa., and Jerry Braunstein, Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 10, 1971, Ser. No. 114,314
Int. Cl. G01n 27/46
U.S. Cl. 204—195 R 5 Claims



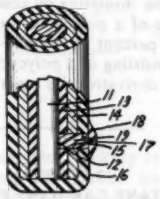
An electrochemical cell and method have been provided which permit continuous monitoring and precise adjustment of the composition of a fuel salt solvent for molten salt nuclear reactors without using electrodes or solutions of extraneous materials as a variable to monitor composition changes. A concentration cell with transference is established which consists of identical half-cells separated by an ion transfer barrier, one having a fixed composition and the other having a composition which is unknown. The emf of the concentration cell, which is a function of the composition change in the half-cell containing the unknown composition, is measured and the molten salt composition determined from a calibration plot.

3,714,015

SENSOR WITH ION EXCHANGE RESIN ELECTROLYTE

Leonard W. Niedrach, Schenectady, N.Y., assignor to General Electric Company

Filed Sept. 4, 1970, Ser. No. 69,650
Int. Cl. G01n 27/46
U.S. Cl. 204—195 P 6 Claims



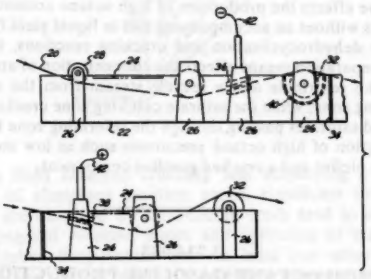
A sensor has an elongated flexible current collector, an electrochemically active region in electrical contact with a portion of the current collector, a second elongated flexible current collector surrounding the first current collector, a second electrochemically active region in electrical contact with a portion of the second current collector, a first layer of electrical insulation disposed between the first and second current collectors, a second layer of electrical insulation disposed over the second current collector, an ion exchange resin electrolyte contacting both electrochemically active regions, and an outer sheath of diffusion barrier material encapsulating at least the electrochemically active regions and the electrolyte. Methods of manufacturing sensors including polarographic oxygen sensors are also described.

3,714,016

ALUMINUM SHIELD FOR A ROLL IN CONTINUOUS STRIP APPARATUS

Robert H. Shoemaker, Royal Oak, and John A. Faler, Livonia, both of Mich., assignors to Kolene Corporation, Detroit, Mich.

Division of Ser. No. 796,722, Feb. 5, 1969, Pat. No. 3,617,455. This application Nov. 23, 1970, Ser. No. 91,888
Int. Cl. B01r 3/00; C23b 5/68
U.S. Cl. 204—211 1 Claim



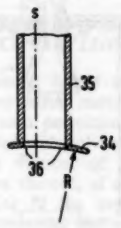
Molten salt bath electrolytic descaling apparatus employing an electrical shield of aluminum around an immersed cast iron roll and electrically charged oppositely from the electrical charge on the strip to prevent current flow from the strip to the electrolyte through the roll.

3,714,017

ELECTRODE DEVICE FOR ELECTROCHEMICALLY FORMING THE PLATES OF TURBINE ROTORS

Gustav Stark, Klaus Otto, and Rolf Geissler, Nurenberg, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Original application Oct. 12, 1967, Ser. No. 674,896, now Patent No. 3,523,876, dated Aug. 11, 1970. Divided and this application Nov. 21, 1969, Ser. No. 878,626
Int. Cl. B23p 1/00
U.S. Cl. 204—284 4 Claims



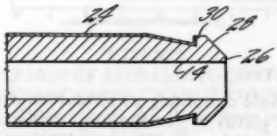
An electrode device for electrolytically forming the blades of multi-stage turbine rotors as integral portions of the rotor body comprises a tubular, inwardly and outwardly insulated shank and a generally annular electrode foot mounted on the shank and having an inner contour in accordance with the profile of a turbine blade to be formed. The outer contour of the electrode foot is made wider than corresponds to the arcuate blade division of the rotor to be produced so that the electrolytical operations for forming each two adjacent turbine blades overlap between the two blades. The working face of the electrode foot is curved cylindrically in accordance with the blade-foot circle of the rotor to be produced. The inner edge of the annular electrode foot is rounded in accordance with the rounding desired at each blade foot where the blade meets the foot circle. The tool electrode affords the complete removal of workpiece material from between the resulting blades and also produces an undistorted cylindrical area along the foot circle between adjacent blades.

3,714,018

ELECTRODE FOR ELECTROCHEMICAL DRILLING

Richard Horace Shaw, Hampden, Mass., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 5, 1971, Ser. No. 131,323
Int. Cl. B23p 1/02, 1/00
U.S. Cl. 204—284 2 Claims

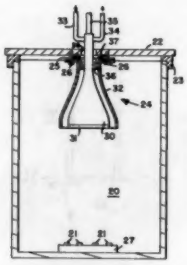


An electrode for electrochemically drilling small diameter holes in which the electrode has a notch closely spaced from the tip with the dielectric coating on the electrode terminating in the notch and with the tip and notch specially shaped to prevent the action of the electrolyte during drilling from peeling off the coating.

3,714,019
CATHODE SPUTTERING ELECTRODE ASSEMBLY

Edward C. Orris, San Jose, Calif., assignor to Ion Equipment Corporation, Santa Clara, Calif.

Filed Feb. 4, 1971, Ser. No. 112,695
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 8 Claims

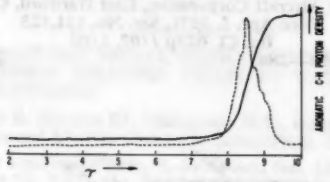


A sputtering electrode assembly is provided for external mounting to a vacuum chamber. A back-up electrode and a layer of target material mounted thereon comprising a part of the assembly extend through a port a short distance into the chamber. The chamber wall serves as a substantial part of the dark space shield surrounding the back-up electrode thereby reducing the distributed capacitance of the assembly as a whole. The provision for external mounting and removal of the assembly from the chamber further minimizes contamination of the chamber from inadvertant release of coolant and other foreign materials into the chamber.

3,714,020
WATER RESISTING AND ANTICORROSIVE PAINT VEHICLE

Satoru Enomoto; Hisayuki Wada; Mikio Fujioka, and Masao Koguro, all of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 23, 1970, Ser. No. 57,666
Claims priority, application Japan, July 23, 1969, 44/57625
Int. Cl. C10g *39/00*
U.S. Cl. 208—14 2 Claims



A paint vehicle comprising a hydrocarbon compound having a specific gravity of from 0.92 to 1.0, a mean molecular weight of from 200 to 1000 measured by a vapor pressure osmotic pressure method, an aromatic C-H proton density of less than 3 percent, said aromatic C-H proton having a τ value of less than 4 determined by nuclear magnetic resonance absorption spectrum, and a transparency such that the percent transmittance of a 10 percent hexane solution thereof, measured by the absorption of visible light of wavelengths longer than 500 mμ, is higher than 60 percent.

3,714,021
THERMALLY STABLE INSULATING OIL

Masaaki Takahashi, Tokyo-to; Takashi Yamauchi, Tokyo; Kensuke Okuda, Tokyo, and Akira Ito, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

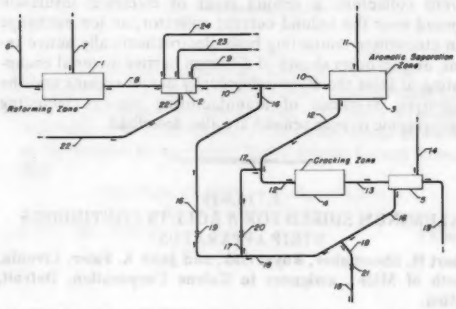
Filed Oct. 22, 1970, Ser. No. 83,232
Claims priority, application Japan, Oct. 22, 1969, 44/84060
Int. Cl. C10g *37/06*
U.S. Cl. 208—14 18 Claims

A thermally stable insulating oil comprising from 95 to 20 percent by volume of a polycyclic naphthenic hydrocarbon and from 5 to 80 percent by volume of a member selected from the group consisting of a polycyclic aromatic hydrocarbon, its lower alkyl derivative and a mixture thereof.

3,714,022
HIGH OCTANE GASOLINE PRODUCTION

Laurence O. Stine, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 885,859, Dec. 17, 1969. This application Sept. 22, 1970, Ser. No. 74,248
Int. Cl. C10g *37/10*
U.S. Cl. 208—62 11 Claims



An integrated refinery process for the production of a high octane gasoline pool. The invention essentially comprises a combination low severity reforming zone, aromatic separation means and a saturate cracking zone. The low severity reforming zone effects the production of high octane aromatic components without an accompanying loss in liquid yield from excessive dehydrocyclization and cracking reactions, the aromatic separation means effects the concentration of aromatics from the reformate and a recycle stream from the saturate cracking zone, while the saturate cracking zone cracks the unreacted saturates passing through the reforming zone to effect production of high octane precursors such as low molecular weight olefins and a cracked gasoline component.

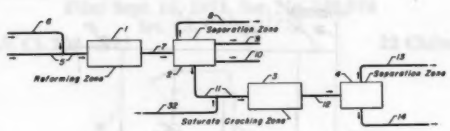
3,714,023
HIGH OCTANE GASOLINE PRODUCTION

Laurence O. Stine, Western Springs, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 17, 1969, Ser. No. 885,859
Int. Cl. C10g *37/10*
U.S. Cl. 208—62 1 Claim

An integrated refinery process for the production of a high octane gasoline pool. The invention essentially

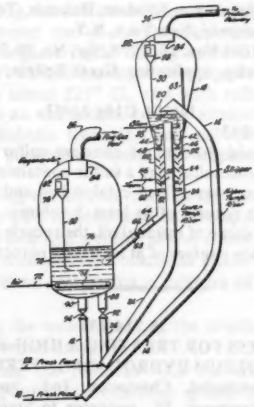
comprises a combination low severity reforming zone and a saturate cracking zone. The low severity reforming zone effects the production of high octane aromatic components without an accompanying loss in liquid yield from excessive dehydrocyclization and cracking reactions while the saturate cracking zone cracks the unreacted saturates passing through the reforming zone to effect production of high octane precursors such as low molecular weight olefins.



3,714,024
METHOD OF CATALYTIC CRACKING OF HYDROCARBONS

Douglas J. Youngblood, Groves, and David L. Reynolds, Nederland, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,380
Int. Cl. C10g *37/02*
U.S. Cl. 208—78 **11 Claims**



In a fluid catalytic cracking unit employing a multiplicity of elongated reaction zones, significant improvements are obtained by introducing fresh feed to each of the elongated reaction zones and operating at least one at a higher temperature than at least one other while maintaining the conversion in the higher temperature zone equivalent to or lower than the conversion in the lower temperature reaction zone. Optionally, the vaporous effluent from either or both reaction zones may be subjected to further cracking in the dense phase of catalyst in the reaction vessel. Higher yields of higher octane gasoline are obtained where the unit is operated in the disclosed manner.

3,714,025
METHOD OF PROCESSING HEAVY SULFUR-BEARING PETROLEUM RESIDUES INTO LOW-SULFUR MOTOR AND BOILER PLANT FUELS

Alexandr Sergeevich Aigenson, Vladimir Vasilievich Fryazinov, and Fatkulla Khairullovich Malikov, Ufa, Julia Sergeevna Sabadash, Grozny, Vladimir Stefanovich Akimov and Natalia Ivanovna Dobrozrakova, Moscow, and Genrikh Arturovich Berg, Boris Mikhailovich Ezhov, and Georgy Alfonsovich Vorms, Ufa, U.S.S.R., and Rudolf Kubicka, Litvinov, Yaroslav Veprek, Uzameckehe parku, and Yaroslav Cir, Litvinov, Czechoslovakia, assignors to Bashkirsky Nauchno-Issledovatelsky Institut Po Pererabotke Nefti, Ufa, U.S.S.R.

No Drawing. Filed July 16, 1970, Ser. No. 55,577
Int. Cl. C10g *13/04*
U.S. Cl. 208—86 **4 Claims**

A method of processing heavy sulfur-bearing petroleum residues into low-sulfur motor and boiler plant fuels, residing in that said petroleum residues are deasphaltized by being treated with solvents which are paraffin hydrocarbons with the number of carbon atoms from 4 to 8, or with mixtures thereof, at a temperature higher than the softening point of the asphaltene concentrate and under a pressure exceeding that of the solvent vapors at said temperature, under liquid-liquid extraction conditions, the deasphaltizate comprising resins and oils constituting an extract phase and the concentrate comprising asphaltenes, metalliferous compounds and ash-forming components with admixtures of resisns and oils constituting a raffinate phase. The resulting deasphaltizate is subjected to catalytic destructive hydrogenation on a catalyst, for which purpose use is made of oxides of metals belonging to Groups VI and VIII of the Periodic System, on aluminum oxide as a carrier, at a temperature of 350–450° C., under a pressure of 100–300 atm., with a space velocity of 0.2–5 hr.$^{-1}$ and at a volume ratio of hydrogen to the deasphaltizate of 200–2000:1.

The high-quality low-sulfur motor fuels obtained by said processing of petroleum residues can be used, e.g., for diesel and carburetor engines, and low-sulfur boiler plant fuels can be used in various power-generating plants, e.g., such as boiler plants.

3,714,026
CONVERSION OF ASPHALTENE-CONTAINING HYDROCARBON CHARGE STOCKS

William K. T. Gleim, Island Lake, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 30, 1971, Ser. No. 176,304
Int. Cl. C10g *13/08, 1/06, 23/02*
U.S. Cl. 208—108 **6 Claims**

Asphaltene-containing hydrocarbonaceous charge stocks are reacted with hydrogen in contact with a catalyst comprising titanium trichloride. The slurry-type process may be effected with the titanium trichloride being composited with a refractory inorganic oxide carrier material. A preferred mode of operation involves unsupported titanium trichloride being admixed with the fresh charge stock.

3,714,027
CONVERSION OF ASPHALIENE-CONTAINING HYDROCARBON CHARGE STOCKS

William K. T. Gleim, Island Lake, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 30, 1971, Ser. No. 176,305
Int. Cl. C10g *1/06, 13/08*
U.S. Cl. 208—108 **4 Claims**

Asphaltene-containing hydrocarbonaceous charge stocks, in slurry admixture with titanium tetrachloride, are reacted with hydrogen. The process may be effected with the titanium tetrachloride being composited with a refractory inorganic

oxide carrier material, although the preferred mode of operation involves a slurry process with unsupported titanium catalyst of unknown constitution which results from titanium tetrachloride, admixed with the fresh charge stock, at reaction conditions in the presence of hydrogen and hydrogen sulfide.

3,714,028

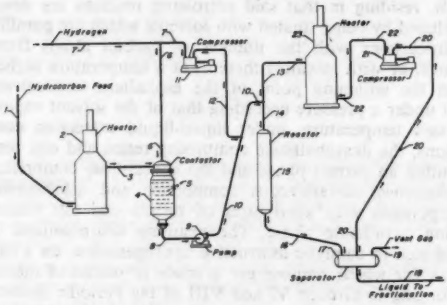
HIGH TEMPERATURE, HIGH PRESSURE HYDROCARBON CONVERSION PROCESS

Newt M. Hallman, Mt. Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 23, 1970, Ser. No. 91,970

Int. Cl. C10g *13/02, 13/04*

U.S. Cl. 208—111 **8 Claims**



Hydroprocessing is effected by contacting the hydrocarbon with hydrogen in a low pressure, vapor-liquid contacting zone maintained under conditions sufficient to dissolve at least a portion of the hydrogen, with the resultant hydrocarbon liquid containing dissolved hydrogen being passed to a high temperature, high pressure reaction zone.

3,714,029

ZINC-CONTAINING ZEOLITE CATALYST

Thomas E. Berry, East Alton, Ill., assignor to Shell Oil Company, New York, N.Y.

Division of Ser. No. 1,854, Jan. 9, 1970, Pat. No. 3,654,185, which is a continuation-in-part of Ser. No. 803,091, Feb. 27, 1969. This application Sept. 15, 1971, Ser. No. 180,828

Int. Cl. C07C *5/22*; C10g *13/02*; B01j *11/40*

U.S. Cl. 208—111 **7 Claims**

A crystalline-alumino-silicate zeolite catalyst support having high crystalline stability and acidic catalytic activity is prepared from an alkali zeolite, preferably a Y-faujasite, by (1) removing the alkali metal ions to below about 1.0%w by ion exchange, and (2) incorporating zinc ions and calcining at a high temperature of about 800°C. The support can then be combined with hydrogenative metals such as Group VIII and Group VIB, followed by drying and calcining to provide superior hydroisomerization and hydrocracking catalysts.

3,714,030

DESULPHURIZATION AND HYDROGENATION OF AROMATIC-CONTAINING HYDROCARBON FRACTIONS

John Winsor, 58 Giffard Drive, Farnborough, and John Carruthers, 42 Sandalwood Avenue, Chertsey, both of England

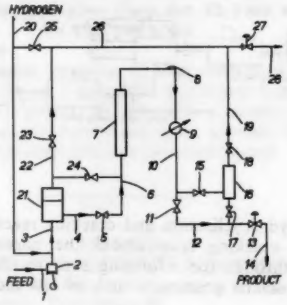
Continuation of Ser. No. 742,734, July 5, 1968, abandoned. This application Nov. 13, 1970, Ser. No. 89,445

Claims priority, application Great Britain, July 11, 1967, 31,771/67

Int. Cl. C10g *23/02*; C07c *5/10*

U.S. Cl. 208—210 **16 Claims**

A liquid phase process is disclosed in which an aromatic-containing hydrocarbon fraction containing up to 50 ppm wt sulphur is desulphurized in the presence of only enough hydrogen to dissolve in the liquid feed-stock at the process conditions. The fraction is passed upwardly or downwardly through a bed of supported nickel catalyst which is preferably nickel sepiolite.



This process may be preceded by conventional catalytic hydrodesulphurization and/or followed by hydrogenation, on one stage if the feedstock contains less than 30 percent wt aromatics and in two stages if the feedstock contains more than 30 percent wt aromatics.

3,714,031

RESIDUAL OIL

Lambertus J. van der Toorn, both of Amsterdam; Jacobus S. M. Ouwerkerk, both of 3 Badhuisweg, Amsterdam, Netherlands, and Jakob van Klinken, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed Nov. 18, 1970, Ser. No. 90,502

Claims priority, application Great Britain, Nov. 18, 1969, 56,357/69

Int. Cl. C10g *23/02*

U.S. Cl. 208—213 **10 Claims**

A desulfurized product of constant sulfur content is obtained by hydrodesulfurizing a sulfur-containing residual oil in the liquid phase over a fixed catalyst bed and applying an external product recycle of at least 3 volumes of desulfurized product per volume of residual oil, the recycle stream having a hydrogen sulfide content of at least 0.05 percent w.

3,714,032

PROCESS FOR TREATING A HIGH-BOILING PETROLEUM HYDROCARBON FEEDSTOCK

Ralph J. Bertolacini, Chesterton, Ind., and Herschel D. Radford, Flossmoor, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Nov. 25, 1970, Ser. No. 92,582

Int. Cl. C10g *23/12*

U.S. Cl. 208—216 **13 Claims**

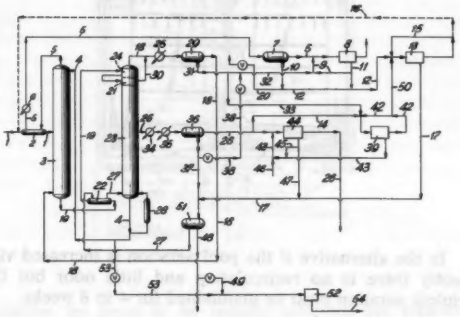
The process comprises contacting the high-boiling petroleum hydrocarbon feedstock under hydrocarbon conversion conditions and in the presence of hydrogen with a catalyst comprising a member selected from the group consisting of (1) uranium and a second hydrogenation metal, (2) their oxides, (3) their sulfides, and (4) mixtures thereof supported on a porous refractory inorganic oxide having an average pore diameter of about 100 Angstroms to about 300 Angstroms and a surface area in excess of 200 square meters per gram. The preferred second hydrogenation metal is molybdenum and the preferred porous refractory inorganic oxide is alumina.

3,714,033

PROCESS FOR THE SEPARATION OF AROMATIC HYDROCARBONS FROM A MIXED HYDROCARBON FEEDSTOCK

George S. Somekh, New Rochelle, Daniel J. Kubek, Tarrytown, and Alexander J. Kosseim, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 16, 1971, Ser. No. 180,996
Int. Cl. C10g 21/28
U.S. Cl. 208—321 22 Claims



A continuous solvent extraction-steam distillation process for the recovery of aromatic hydrocarbons having boiling points in the range of about 80° C. to about 175° C. from a feedstock containing aliphatic hydrocarbons and said aromatic hydrocarbons comprising the following steps:

(a) Contacting the feedstock in an extraction zone with a mixture of water and a solvent, said solvent being a water-miscible organic liquid having a boiling point of at least about 200° C. and having a decomposition temperature of at least about 225° C., and with reflux hydrocarbons to provide an extract comprising aromatic hydrocarbons, reflux aliphatic hydrocarbons, solvent, and water and a raffinate comprising essentially aliphatic hydrocarbons;

(b) Contacting the extract with steam in a distillation zone to provide an overhead distillate comprising a reflux hydrocarbons phase and a water phase, a side cut distillate comprising an aromatic hydrocarbons phase and a water phase, and bottoms comprising a mixture of solvent and water;

(c) Dividing the water phase of the overhead distillate into first and second streams;

(d) Contacting the raffinate with the first stream to provide an aliphatic hydrocarbons phase and a water phase;

(e) Contacting the second stream with an aromatic hydrocarbons stream containing at least 95 percent aromatic hydrocarbons, the amount of said stream being in the range of about 0.1 percent to about 5 percent by weight of the total aromatic hydrocarbons in the feedstock, to form an aromatic hydrocarbons phase and a water phase;

(f) Contacting the aromatic hydrocarbons phase of the side-cut distillate with the water phase of (e) to form an aromatic hydrocarbons phase and a water phase;

(g) Contacting the water phase of step (d) with an aromatic hydrocarbons stream containing at least 95 percent aromatic hydrocarbons, the amount of said stream being in the range of about 0.1 percent to about 5 percent by weight of the total aromatic hydrocarbons in the feedstock to form an aromatic hydrocarbons phase and a water phase;

(h) Recycling the water phases of steps (f) and (g) to the distillation zone where said water phases are essentially converted to steam;

(i) Recycling the reflux hydrocarbons phase of the overhead distillate and the bottoms of step (b) to the extraction zone to provide reflux hydrocarbons and mixture of water and solvent, respectively, for step (a); and

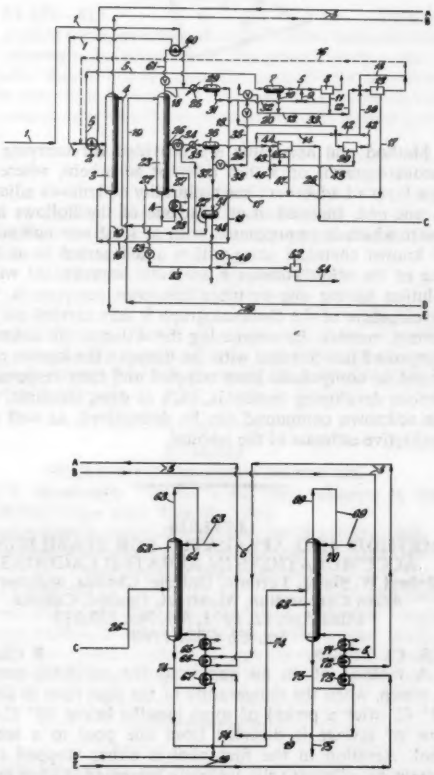
(j) Recovering the aromatic hydrocarbons phase of step (f) and the aliphatic hydrocarbons phase of step (d).

3,714,034

PROCESS FOR THE SEPARATION OF AROMATIC HYDROCARBONS FROM A MIXED HYDROCARBON FEEDSTOCK

Alexander Jean-Marie Kosseim, Yorktown Heights, Daniel John Kubek, North Tarrytown, and George Solomon Somekh, New Rochelle, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,055
Int. Cl. C10g 21/28
U.S. Cl. 208—321 24 Claims



A continuous solvent extraction-steam distillation process for the recovery of aromatic hydrocarbons from a mixed feedstock. The feedstock is contacted with a solvent-water mixture at temperatures in the range of about 75°

C. to 200° C. and the extract and raffinate streams are separated into their components. Heat for the various distillation zones is partially supplied by heat exchange with the extract and raffinate streams.

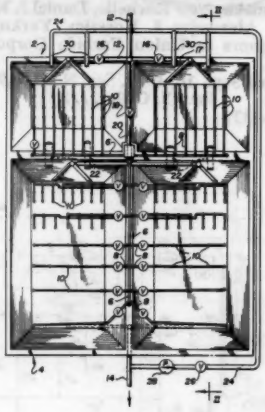
3,714,035
METHOD AND APPARATUS FOR THIN LAYER CHROMATOGRAPHY
Donald W. Jones, P.O. Box 1308, Auburn, Calif. 95603
Filed May 19, 1971, Ser. No. 146,577
Int. Cl. B01d *15/08*
U.S. Cl. 210—31 C **22 Claims**

Method and apparatus are provided for carrying out chromatographs on a thin layer of adsorbent, where the thin layer of adsorbent has a plurality of hollows adjacent to one end. Inserted in at least one of the hollows is an insert which is impregnated with at least one compound of known chemical composition and inserted in at least one of the other hollows is an insert impregnated with a solution having one or more unknown compounds. The development of the chromatograph is then carried out in a normal manner. By comparing the distance the unknown compound has traveled with the distance the known compound or compounds have traveled and their response to various developing materials, such as dyes, oxidants, etc., the unknown compound can be determined, as well as a qualitative estimate of the amount.

3,714,036
METHOD AND APPARATUS FOR STABILIZING ACCUMULATIONS IN AERATED LAGOONS
Robert W. Slater, Toronto, Ontario, Canada, assignor to Atara Corporation, Montreal, Quebec, Canada
Filed Apr. 12, 1971, Ser. No. 133,012
Int. Cl. C02c *1/02*
U.S. Cl. 210—8 **9 Claims**

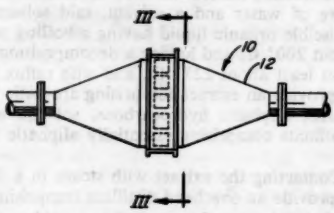
A method of an an apparatus for purifying sewage in which, when the temperature of the pool rises to above 15° C. after a period of some months below 10° C. the flow of sewage is diverted from one pool to a second pool. Aeration in the first pool is either stopped completely or, alternatively, violently increased. Either method allows the winter's accumulation of decomposable but undecomposed material to be completely digested.

If the aeration is stopped completely, this cessation lasts for about 3 to 6 weeks after which both full sewage flow and aeration are resumed; preferably, some of the completely treated liquid outflow from the second pool is recirculated back to the first pool—this covers the top of the first pool with a layer of treated liquid and reduces the offensive odor and also ensures a gradual displacement of liquid from the first pool.



In the alternative if the pool aeration is increased violently there is no recirculation and little odor but the violent aeration must be maintained for 4 to 8 weeks.

3,714,037
FLOCCULATING APPARATUS AND METHOD
Gabriel Charles Almasi, Beaver, and William Slusarczyk, Industry, both of Pa., assignors to Crucible Inc., Pittsburgh, Pa.
Filed Jan. 27, 1971, Ser. No. 110,197
Int. Cl. B01d *17/06*
U.S. Cl. 210—42 **5 Claims**

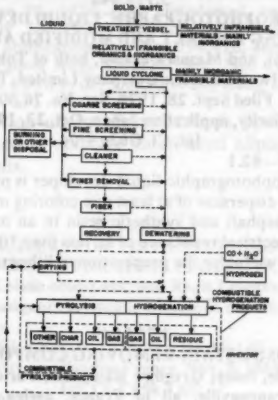


Apparatus and method for the removal of magnetic particles from a liquid stream by introducing the particle-containing liquid stream into a restricted passage having a large width to height ratio without any change in cross-sectional area. The passage is provided with a magnetic field, the lines of force of which are substantially at right angles to the lengthwise liquid-flow direction through said passage. The particles are magnetized and agglomerate so that down-stream they may be removed by a filter or a settling tank.

3,714,038
PROCESS AND PRODUCT FOR CONVERTING ORGANIC MATERIALS BY PYROLYSIS OR HYDROGENATION
Paul G. Marsh, Hamilton, Ohio, assignor to The Black Clawson Company, Hamilton, Ohio
Filed Dec. 18, 1970, Ser. No. 99,554
Int. Cl. B01d *17/00*
U.S. Cl. 210—59 **12 Claims**

A process for chemically changing solid waste materials to obtain valuable organic products therefrom consists of pulping a mixture of organic and inorganic wastes

in a liquid such as water to form a slurry, removing inorganics from the slurry, dewatering the resulting slurry of organics and either pyrolyzing or hydrogenating the dewatered slurry. Additionally, if it is desired to sort the



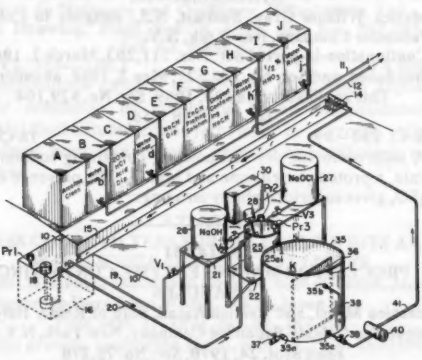
organics by types or by specific materials for separate pyrolysis or hydrogenation, this may be done by one or more screening, classifying or separating steps intermediate the pulping and pyrolysis or hydrogenation steps.

3,714,039

TREATMENT OF WASTE METAL PROCESSING SOLUTION SPILLAGE

Leslie E. Lancy, Ellwood City, and Ivan E. Wittmann, Wexford, Pa., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 13, 1971, Ser. No. 133,520
Int. Cl. C02b *11/36*; C02c *5/02*
U.S. Cl. 210—60 **18 Claims**



A process for treating spillage and waste solutions from a line of metal finishing processing solution tanks to prevent the forming of toxic hydrogen cyanide gas is provided and continuously utilized by flowing a waste solution receiving and conditioning liquid along a floor catch basin. The conditioning liquid with its liquid waste content from a lower end of the catch basin is collected in an end-positioned sump having sufficient capacity to allow safe treatment of the probable worst condition with regard to the spillage of acid and cyanide solution containing tanks of the processing line. A pH indicator is provided at the sump for immediately indicating the approach of the solution to or the attainment of an acid pH due, for example, to a major spillage or a complete loss of solution from an acid containing tank of the line. This indicator is connected to cause the opening of a normally closed valve for immediately supplying a neutralizing alkaline chemical, such as sodium hydroxide, to the solution in the sump and bring it up to and maintain it within an alkaline pH range to inhibit the formation of toxic hydrogen cyanide gas. The solution from the sump is continuously flowed into a conditioning tank, at which time, a soluble alkaline chemical, such as an earth metal hydroxide, is added to raise its pH, and a cyanide reacting chemical, such as sodium or calcium hypochlorite or chlorine, may be added to react with any cyanide content to destroy cyanide chemicals through oxidation by chlorine in the alkaline range. The solution is moved from the conditioning tank into a reservoir where it is held to precipitate-out and settle the precipitated metal salts and provide a fully reconditioned aqueous liquid or solution for reutilization.

3,714,040

PROCESS OF REGENERATING CARBON BEDS

Robert L. Jordan; Norman E. Wilson, both of Fort Worth, and Thomas M. Goldman, Houston, all of Tex., assignors to Stauffer Chemical Company, New York, N.Y.

Filed Oct. 16, 1970, Ser. No. 81,528
Int. Cl. B01j *11/02*
U.S. Cl. 252—415 **2 Claims**

A process for regenerating activated carbon beds saturated with chlorine is described herein. The process involves injecting sulfur dioxide into the beds. The sulfur dioxide is oxidized by the chlorine to sulfuric acid. The injection of sulfur dioxide is continued until the effluent contains the same amount as the input.

3,714,041

THICKENED ORGANIC LIQUIDS

Asgeir Asgeirsson, Newtonville, Mass., assignor to Cabot Corporation, Boston, Mass.

Filed Jan. 17, 1967, Ser. No. 609,759
Int. Cl. C10m *5/04*, *7/08*
U.S. Cl. 252—13 **16 Claims**

Organic liquids thickened with small amounts of:

A. colloidal silica selected from the group consisting of pyrogenic silicas, silica aerogels, and mixtures thereof, and

B. fibrous asbestos.

3,714,042

TREATED OVERBASED COMPLEXES

Paul E. Greenough, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 811,204, March 27, 1969, abandoned. This application Feb. 4, 1970, Ser. No. 8,701
Int. Cl. C10m *1/40*, *1/24*, *3/24*
U.S. Cl. 252—33.2 **17 Claims**

Treat overbased complexes with high molecular weight aliphatic carboxylic acids, anhydrides, esters, amides, imides, or salts. The treated overbased complexes may be used as additives in lubricating oils, gasolines, and other organic materials.

3,714,043

POLYPHENYL THIOETHER LUBRICATING COMPOSITIONS

Frank S. Clark, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 28, 1971, Ser. No. 148,123
Int. Cl. C10m *1/48*, *1/46*
U.S. Cl. 252—46.7 **7 Claims**

Phenoxyphenylphosphinic acids and lubricating compositions comprising polyphenyl thioethers, polyphenyl

ethers-thioethers or mixtures thereof and small amounts of said acids have improved lubricating properties over wide temperature ranges.

3,714,044

FLUOROSILICONE LUBRICANTS CONTAINING NITROPHENYL-SUBSTITUTED ORGANOPOLYSILOXANES

Yung Ki Kim, Midland, Mich., assignor to Dow Chemical Corporation, Midland, Mich.

No Drawing. Filed Aug. 19, 1971, Ser. No. 173,274
Int. Cl. C10m *3/44, 7/48*
U.S. Cl. 252—49.6 6 Claims

Minor amounts of nitrophenyl-substituted siloxanes are added to fluorosilicone lubricants to improve the steel on brass and steel on aluminum antiwear characteristics.

3,714,045

LUBRICANT COMPOSITIONS

Gerassimos Frangatos, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

No Drawing. Filed Aug. 5, 1970, Ser. No. 61,519
Int. Cl. C10m *1/32*
U.S. Cl. 252—51.5 A 9 Claims

Lubricants are stabilized against oxidative deterioration by adding thereto a small amount of a product produced from a primary arylamine and an alpha-olefin-maleic anhydride heteropolymer.

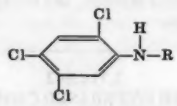
3,714,046

METAL-WORKING FLUID CONTAINING A 2,4,5-TRICHLOROANILINE DERIVATIVE AS A MICROBIOCIDE

Phillip Adams, Murray Hill; Alfonso N. Petrocci, Glen Rock, and John J. Merianos, Jersey City, all of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 875,499, Nov. 10, 1969. This application March 19, 1971, Ser. No. 126,333
Int. Cl. C10m *1/20, 1/30, 1/32*
U.S. Cl. 252—51.5 R 1 Claim

Derivatives of 2,4,5-trichloroaniline having the general formula:



wherein R is the residue of an aliphatic, alicyclic, aromatic or arylaliphatic compound. These derivatives possess marked anti-microbial power.

3,714,047

INSULATING MATERIAL

Frank A. Marion, and Hugh J. McSpadden, both of Riverside, Calif., assignors to Universal Propulsion Co., Riverside, Calif.

Continuation-in-part of Ser. No. 802,198, Feb. 25, 1969, abandoned. This application March 17, 1970, Ser. No. 20,431
Int. Cl. C09k *3/28*; C04b *43/00*
U.S. Cl. 252—62 32 Claims

This invention relates to self-extinguishing insulating compositions containing coolants which undergo endothermic decomposition when subjected to elevated temperature. The coolants are incorporated in various types of binder: One is combustible without leaving any solid residue. Another has the property of forming a foamed char to facilitate transpirational cooling at the heat-exposed surface. A third is incombustible. Various other substances, such as catalysts, oxidizers and plasticizers, may also be included.

3,714,048

ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING ASPHALT AND MODIFIED ALKYL RESIN

Syozo Adachi, and Masasi Ueyama, both of Tokyo, Japan, assignors to Iwatsu Electric Company Limited, Tokyo, Japan

Filed Sept. 28, 1970, Ser. No. 76,307
Claims priority, application Japan, Oct. 23, 1969, 44/84910
Int. Cl. G03g *9/04*
U.S. Cl. 252—62.1 4 Claims

An electrophotographic liquid developer is provided which comprises a dispersion of at least one coloring material in particle form, asphalt and synthetic resin in an organic solvent having an electrical resistance of no less than $10^8\Omega$. The liquid developer is useful for the preparation of lithographic plates.

3,714,049

AEROSOL STAIN-REMOVING COMPOSITION

Roger Charle, Soisy; Gregoire Kalopissis, Paris, and Charles Zviak, Franconville, all of France, assignors to Societe anonyme dite: L'Oreal

Filed Feb. 4, 1970, Ser. No. 8,727
Claims priority, application Luxembourg, Feb. 4, 1969, 57896
Int. Cl. C11d *17/00*; C09k *3/30*; B01j *13/00*
U.S. Cl. 252—90 3 Claims

A sprayable aerosol stain-removing composition contained under pressure in a container therefor includes an aerosol propellant, a stain-removing agent and a finely divided solid absorbent. Either or both of the stain-removing agent and finely divided solid absorbent are microencapsulated in a polymeric material inert to both the propellant and the stain-removing agent.

3,714,050

STAIN REMOVAL

Frederick William Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. Nos. 711,203, March 7, 1968, abandoned, and Ser. No. 726,571, May 3, 1968, abandoned. This application May 29, 1969, Ser. No. 829,104
Int. Cl. C11d *7/56*
U.S. Cl. 252—99 18 Claims

A stain-removing dry composition containing sodium perborate, a proteolytic enzyme and $MgSO_4$. The presence of the $MgSO_4$ gives superior stability on aging.

3,714,051

PROCESS FOR MAKING ENZYME-CONTAINING GRANULES

Domenico Milesi, and Remigo Natali, both of Rome, Italy, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 24, 1970, Ser. No. 75,270
Claims priority, application Italy, Sept. 24, 1969, 40261 A/69
Int. Cl. C11d *3/06, 7/42, 11/00*
U.S. Cl. 252—135 9 Claims

A granular free-flowing, non-dusting, non-tacky, enzyme-containing detergent composition is made by (a) forming a fluidized bed of enzyme particles and a particulate hydratable builder salt; (b) contacting the fluidized particles with an aqueous liquid to form agglomerates of said enzyme and builder salt; (c) recovering the agglomerates from the bed; and (d) tumbling the agglomerates for a period of from 3 to about 30 minutes.

3,714,052

CHLORINATED HYDROCARBONS STABILIZED WITH ALKOXYALDEHYDE HYDRAZONE AND GLYCIDOL

Norman L. Beckers, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Continuation-in-part of applications Ser. No. 43,214, June 30, 1970, now abandoned, and Ser. No. 54,567, July 13, 1970, both continuations-in-part of abandoned application Ser. No. 794,410, Jan. 27, 1969. This application Aug. 2, 1971, Ser. No. 168,468

Int. Cl. C09d *9/00*; C011d *7/50*; C23g *5/02*

U.S. Cl. 252—171 4 Claims

A combination of an alkoxyaldehyde hydrazone and glycidol is used to stabilize chlorinated aliphatic hydrocarbon solvents.

3,714,053

PLASTICIZERS FOR VINYL POLYMERS AND PROCESSES FOR THEIR PRODUCTION

Paul Mottez, Loison-sous-Lens, and Regis Lejeune, Lens, both of France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Nov. 9, 1970, Ser. No. 88,147

Claims priority, application France, Nov. 7, 1969, 6938438

Int. Cl. C09k *3/00*

U.S. Cl. 252—182 10 Claims

A plasticizer for a vinyl polymer consisting of a mixture of phthalate of (trimethyl pentane diol-1,3 monoisobutyrate) and of benzyl, and of phthalate of butyl or isobutyl and of benzyl and a process for the production thereof by reacting preferably 0.5 g. mole of trimethyl-2,2,4 pentane diol-1,3, monoisobutyrate with lg. mole of phthalic anhydride, reacting the product with a butyl alcohol, neutralizing the obtained phthalates and reacting the salts with benzyl chloride to esterify the remaining unesterified functions of the phthalic anhydride to form the plasticizer.

3,714,054

CHEMILUMINESCENT COMPOSITION CONTAINING SURFACTANT

Edward T. Cline, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 8, 1965, Ser. No. 507,081

Int. Cl. C09k *3/00*

U.S. Cl. 252—188.3 10 Claims

Compositions capable of emitting light when exposed to air consisting of emulsions of an oxyluminescent tetrakis(disubstituted-amino)ethylene in aqueous alkali containing non-ionic, anionic, cationic or amphoteric surfactants.

3,714,055

GLASS COLOR FILTERS FOR USE UNDER WHITE AND WARM WHITE FLUORESCENT LIGHTS

Takashi Matsuura, and Mitsuo Chikano, both of Tokyo, Japan, assignors to Hoya Glass Works, Tokyo, Japan

Filed Sept. 17, 1971, Ser. No. 181,494

Claims priority, application Japan, Sept. 18, 1970, 45/81804

Int. Cl. F21u *9/00*; C03c *3/04*, *3/10*

U.S. Cl. 252—300 1 Claim

Glass color filters suitable for use in color photography under white and warm white fluorescent lights are prepared from a glass composition comprising 100 parts of base glass composed of, by weight, 47.0 – 60.0 percent silicic acid anhydride, 0 – 5.0 percent boric acid anhydride, 10.0 – 24.0 percent of either one or both of sodium oxide and potassium oxide, 3.0 – 7.0 percent calcium oxide, 18.0 – 35.0 percent of either one or both of barium oxide and lead oxide, and 0.2 – 0.5 percent arsenic oxide, and a coloring agent composed of, by weight, 0.5 – 1.8 percent manganese dioxide, 0 – 0.8 % copper oxide, and 0.3 – 2.5 percent neodymium oxide.

3,714,056

METHOD FOR PREPARING STABLE URANIA-PLUTONIA SOLS

Othar K. Tallent, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Continuation-in-part of abandoned application Ser. No. 864,155, Oct. 6, 1969. This application June 10, 1971, Ser. No. 151,902

Int. Cl. C01g *43/02*

U.S. Cl. 252—301.15 5 Claims

The present invention relates to a method for forming a static and dynamically stabilized mixed sol of plutonia and urania where the plutonium and uranium are primarily in the +4 oxidation state and where the sols are derived from solvent extraction of aqueous solutions of uranium nitrate and plutonium nitrate which comprises heating the urania sol component at a temperature and for a period of time sufficient to produce urania crystallities in the range 55–100 angstroms and then extracting nitrate ion from the mixed sol until a nitrate/uranium+plutonium mole ratio of 0.08 to 0.25 is obtained and to the resultant sol.

3,714,057

IODIDE ACTIVATED THALLIUM CHLORIDE SCINTILLATOR

Robert Hofstadter, Stanford, Calif.; Gerald R. Kramer, Cleveland Heights, Ohio; Mohammed R. Farukhi, Cleveland, Ohio, and King H. Rosette, Twinsburg, Ohio, assignors to Kewanee Oil Company, Bryn Mawr, Pa.

Filed Nov. 12, 1969, Ser. No. 876,112

Int. Cl. C09k *1/06*; G01t *1/10*, *1/202*

U.S. Cl. 252—301.4 R 4 Claims

A new high Z scintillator capable of generating light radiation upon exposure to nuclear radiation such as gamma rays, beta rays, protons, mesons, X-rays, etc. wherein said scintillator is transparent to said light radiation and consists of a major amount of thallium chloride and a minor amount of an iodide containing compound.

3,714,058

PROCESSING OF IRRADIATED NUCLEAR FUEL

Alfred Leonard Mills, Thurso, Caithness, Scotland, and Kenneth Hartley, Seascale, Cumberland, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 26, 1969, Ser. No. 853,193

Claims priority, application Great Britain, Sept. 18, 1968, 44,452/68

Int. Cl. G09k *3/00*

U.S. Cl. 252—301.1 R 3 Claims

Irradiated monocarbide nuclear fuel which may contain significant plutonium as well as uranium is converted to oxide by heating in carbon dioxide, preferably at a temperature of 1,000° C. Sesquicarbide may also be present. The product is dioxide soluble in nitric acid.

3,714,059

NEODYMIUM GLASS LASER HAVING ROOM TEMPERATURE OUTPUT AT WAVELENGTHS SHORTER THAN 1060 NM

Robert R. Shaw, and Charles C. Robinson, both of Sturbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed March 10, 1971, Ser. No. 122,723

Int. Cl. C09k *1/04*; C03c *3/28*

U.S. Cl. 252—301.4 F 7 Claims

Laserable material doped with a quantity of neodymium ions in a low concentration (vis., 0.10–3 wt. percent) which results in the glass exhibiting a ratio of fluorescent intensity peaked at 920 nanometers over the fluorescent intensity peaked at approximately 1060 nanometers of at least 0.4 as

measured by a Cary Model 14 spectrophotometer. The glasses enable the generation of laser light in a waveband with an optical center at about 920 nanometers at room temperature (approximately 20°C) when positioned in a laser cavity which is resonant at 920 nanometers.

3,714,060

NUCLEAR REACTOR FUEL AND FUEL ELEMENT AND PREPARATION THEREOF

Marvin Tetenbaum, Hinsdale, and Paul D. Hunt, Lemont, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Feb. 12, 1971, Ser. No. 115,121

Int. Cl. C01g *43/00*

U.S. Cl. 252—301.1 R **5 Claims**

A nuclear reactor fuel and fuel element therefrom comprising uranium oxycarbide containing 500–2500 parts per million of oxygen having the empirical formula

$$UC_{1.00}O_{.01-.05}$$

prepared by heating single phase UC at a temperature in the range of about 2000° K.–2400° K., passing helium carrier gas containing CO and CO_2 over said heated UC at a sufficiently high ratio of CO to CO_2 to prevent formation of UO_2, such as at 10,000:1, and for a time to produce said product.

3,714,061

PROCESS FOR PREPARING IMPREGNATED URANIA AND URANIUM BEARING MICROSPHERES

Leonard Vincent Triggiani, Silver Spring, and Irving Charles Stone, Ashton, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 723,561, April 23, 1968, Pat. No. 3,518,065. This application March 21, 1969, Ser. No. 871,229

Int. Cl. C09k *3/00*

U.S. Cl. 252—301.1 S **4 Claims**

A process for preparing urania fuel particles in which the oxygen to uranium ratio is reduced to 2.0 by passing a reducing gas through a heated bed of the particles.

3,714,062

STRAIGHT CHAIN SULFONATES FOR USE IN SOLUBILIZED OIL-WATER SOLUTIONS FOR MISCIBLE WATERFLOODING

Warren S. Askew and H. R. Froning, Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

No Drawing. Filed Aug. 8, 1969, Ser. No. 848,748

Int. Cl. B01j *13/00*

U.S. Cl. 252—308 **9 Claims**

Solubilized oil-water solutions of high water content and resistant to calcium and magnesium ions are prepared by mixing a solution of an alkali metal aliphatic hydrocarbon polymer sulfonate having an average molecular weight ranging from about 350 to about 675 with a cosurfactant or coupling agent which may be a water soluble alcohol, an oil soluble alcohol having not more than 10 carbon atoms, or an ethylene oxide adduct of an alcohol having from 4 to 10 carbon atoms. These solutions are useful as oil solvents in miscible waterflooding and can also be employed as solvents in water injection well cleanout procedures.

3,714,063

METHOD AND COMPOSITION FOR EMULSIFYING PETROLEUM PRODUCTS WITH A VIEW TO PREPARING A CULTURE MEDIUM FOR MICRO-ORGANISMS

Georges Henri Salomone, 14 Avenue Pierre Ier de Serbie, Paris, France

No Drawing. Filed Jan. 29, 1971, Ser. No. 111,104

Claims priority, application France, Feb. 3, 1970, 7003765

Int. Cl. B01j *13/00*

U.S. Cl. 252—312 **1 Claim**

Petroleum products are rendered bio-degradable to produce fertilizer, by admixing therewith, per 100 parts by weight of petroleum product, 40 to 1000 parts by weight of a mixture which is 20% to 50% by weight of a carbohydrate or protein nutrient for the micro-organisms, 30% to 50% by weight of an organic acid, and 0% to 30% by weight of alkali or alkaline earth salt.

3,714,064

PRODUCTION OF SMALL PARTICLE SIZE AQUEOUS COLLOIDAL SILICA SOLS

Peter H. Vossos, Lisle, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

No Drawing. Continuation-in-part of applications Ser. No. 664,310, Aug. 30, 1967, and Ser. No. 744,285, June 12, 1968, both now abandoned. This application Apr. 22, 1971, Ser. No. 136,586

Int. Cl. B01j *13/00*; C01b *33/14*

U.S. Cl. 252—313 S **2 Claims**

The invention is directed to aqueous colloidal silica sols which are concentrated, yet are in the form of extremely finely divided, discrete, dense particles whose average particle size is less than 5 millimicrons. Typical sols produced in accordance with the invention have the following characteristics:

Average particle size diameter	2 but less than 5 mμ.
Percent silica, as SiO_2	10 to 25%.
pH	9 to 11.
SiO_2/Na_2O	>15.

The invention also is directed to a method of producing such sols wherein an acidic aqueous colloidal silica sol having an SiO_2 concentration of 5–10% by weight and a particle size diameter of less than 5 millimicrons is alkalized, a portion of the resulting alkaline sol is heated under evaporation conditions to a temperature not greater than 150° F., evaporation is maintained at constant volume by adding unheated alkaline sol, and said evaporation is continued until the silica concentration is within the range of 10–25% by weight.

3,714,065

PROCESS FOR PREPARING A MICRO CAPSULE

Masao Kitajima; Asaji Kondo, both of Saitama; Masataka Morishita, and Jinnosuke Abe, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa; Toyo Jazo Co., Ltd., Shizuoka, both of Japan

Filed Feb. 3, 1971, Ser. No. 112,394

Claims priority, application Japan, Feb. 3, 1970, 45/9382

Int. Cl. B01j *13/02*; B44d *1/02*; A61k *9/04*

U.S. Cl. 252—316 **16 Claims**

A process for preparing microcapsules which comprises; dissolving a film-forming polymer in an organic solvent to form a solution, said solvent having a dielectric constant between 10 and 40 and a poor compatibility with liquid paraffins and silicone oils; dispersing a core substance in the solution, to form a first dispersion; dispersing said first dispersion in an encapsulating medium comprising a liquid paraffin or a silicone oil in the form of fine droplets; and evaporating the solvent and the encapsulating medium from the dispersion.

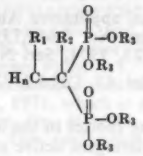
3,714,066

METHODS OF INHIBITING CORROSION WITH ETHANE DIPHOSPHONATE COMPOSITIONS

Thomas M. King, St. Louis, and Howard L. Vandersall, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed April 13, 1970, Ser. No. 27,982
Int. Cl. C23f 11/10, 11/16
U.S. Cl. 252—389 A 31 Claims

Ethane diphosphonates having the formula



wherein R_1 and R_2 are hereinafter defined and R_3 is hydrogen or a metal ion and n is an integer having a value of 1 or 2, along or in combination with zinc, dichromate, certain thiols and 1,2,3-triazoles and mixtures thereof, are disclosed as inhibiting the corrosion of metals by oxygen-bearing waters.

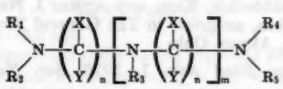
3,714,067

METHODS OF INHIBITING CORROSION WITH CONDENSED POLYALKYLENEPOLYAMINE PHOSPHONATES

Thomas M. King, St. Louis, and Robert S. Mitchell, Webster Groves, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed July 7, 1971, Ser. No. 160,550
Int. Cl. C23f 11/10, 11/16
U.S. Cl. 252—389 A 20 Claims

Condensed polyalkylenepolyamine derivatives having the formula



wherein R_1, R_2, R_3, R_4, R_5, X and Y are hereinafter defined, n is 1 – 15 and m is 1 – 20, alone or in combination with zinc, dichromate, certain thiols and 1,2,3-triazoles and mixtures thereof, are disclosed as inhibiting the corrosion of metals by oxygen-bearing waters.

3,714,068

SILICA

James R. Miller and Richard H. Pierce, Broomall, Robert W. Linton, Springfield, and John H. Wills, Thornbury Township, Pa., assignors to Philadelphia Quartz Company, Philadelphia, Pa.

Continuation-in-part of applications Ser. No. 574,899, Aug. 25, 1966, Ser. No. 817,865, Apr. 21, 1969, and Ser. No. 854,783, Sept. 2, 1969, all now abandoned. This application Dec. 28, 1970, Ser. No. 101,640
Int. Cl. B01d 17/00
U.S. Cl. 252—358 3 Claims

Improved micro fine silicas are prepared with modified surface layers. The surface may be modified by controlling the pH of the silica slurry between about 1.5 and 12 and permanently affixing from 6 to 20% of a siloxane or silane based on the weight of the silica. The surface may be further controlled by varying the composition of the water layer on the surface of the silica and by controlling the choice and curing of the silicone and/or silica. An especially improved defoamer for aqueous systems is thus formed by compounding 3 to 30% of the improved hydrophobic silica having between about 2.5 and 8% of Na_2O and an area below about 175 $m.^2/g.$ with an organic hydrocarbon liquid, said composition having a viscosity of from about 10 to 3000 cps.

3,714,069

CORROSION PREVENTING COMPOSITION

Barbara J. Northan, Chicago, Ill., and David B. Boies, Columbia, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 17, 1970, Ser. No. 99,285
Int. Cl. C23f 11/16
U.S. Cl. 252—389 A 5 Claims

A composition for significantly improving corrosion protection comprising the combination of an alkylaryl sulfonate with a surface active agent including partial organic phosphate esters neutralized with ethylenediamine or barium. An aromatic petroleum hydrocarbon resin is added to enhance protection in crevice areas and to improve handling characteristics.

3,714,070

NON-CORROSIVE SULFUR-LIQUID HYDROCARBON SLURRY CONTAINING A CORROSION INHIBITING AMOUNT OF A POLAR-CONTAINING SOLVENT

Mary Frances Vondrak, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 774,218, Oct. 30, 1968, Pat. No. 3,606,482. This application Feb. 19, 1971, Ser. No. 117,151
Int. Cl. C09k 3/00
U.S. Cl. 252—396 3 Claims

An improved non-corrosive sulfur-liquid hydrocarbon slurry composition and a method for the preparation and corrosive inhibition of such a slurry, particularly for subsequent transportation through pipelines or vehicles and conduits without causing plugging and corrosion.

3,714,071

LOW DENSITY ALUMINA SPHERES OF IMPROVED STRENGTH AT HIGH TEMPERATURE

Edward Michalko, Lombard, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed March 18, 1970, Ser. No. 20,808
Int. Cl. B01j 11/32, 11/44
U.S. Cl. 252—448 11 Claims

Low density alumina spheres of improved strength at high temperature are prepared by commingling an acidic alumina sol and an aqueous rare earth metal salt solution with an ammonia precursor at below gelation temperature and dispersing the mixture as droplets in a hot oil bath. The hydrogel spheres which form are aged, washed and dried, and calcined. Low density alumina spheres are useful as a catalyst or as a catalyst support, particularly in the conversion of hot exhaust gases from an internal combustion engine.

3,714,072

PROCESS FOR THE PREPARATION OF CATALYSTS CONTAINING CRYSTALLINE ALUMINOSILICATE ZEOLITES

Hendrik Jan Maat, Uitgeest, and André Lucas Berg, Amsterdam, Netherlands, assignors to Kominklijke Zwavelzuurfabrieken voorheen Ketjen N.V., Amsterdam, Netherlands

No Drawing. Filed June 4, 1970, Ser. No. 43,587
Claims priority, application Netherlands, June 18, 1969, 6909263
Int. Cl. B01j 11/36, 11/40
U.S. Cl. 252—451 11 Claims

An aqueous suspension of a zeolite, which has had its alkali metal content reduced by at least one ion exchange reaction and has then been thermally treated, is combined with an aqueous alkaline alkali metal silicate

solution, and silicon dioxide is gelled from the zeolite-containing solution by the addition of mineral acid, preferably to the silicate solution immediately before the combining of the latter with the zeolite suspension. The resulting zeolite-containing gel is combined with a solution or solutions of at least one compound of a metal from groups II–A, III–A and IV–A of the Periodic Table, and then hydrolyzed, whereupon the zeolite containing precipitate is washed and dried to provide a catalyst containing a crystalline aluminosilicate zeolite, silicon dioxide and an oxide of at least one metal from the mentioned groups of the Periodic Table.

3,714,073

SEMICONDUCTIVE GLASS HAVING LOW RESISTANCE

Tetsuro Izumitani, Tokyo; Yoshiyuki Asahara, Kanagawa; Makoto Tsuchiya, Tokyo, and Osamu Nagarekawa, Saitama, all of Japan, assignors to Hoya Glass Works, Tokyo, Japan

Filed Aug. 27, 1971, Ser. No. 175,603
Claims priority, application Japan, Aug. 28, 1970, 45/75419
Int. Cl. H01b *1/06*; C03c *3/30*
U.S. Cl. 252—512 5 Claims

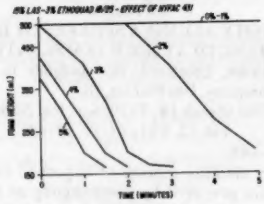
A semiconductive glass consisting of three componants of As, Te, and Tl, the glass which has a very low specific resistance and is stably vitrified.

3,714,074

FOAM PROFILE REGULATING COMPOSITION AND ANIONIC DETERGENT COMPOSITION CONTAINING SAME AND HAVING INVERSE FOAM TO TEMPERATURE RELATIONSHIP

Jack Thomas Inamorato, Westfield, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 28, 1970, Ser. No. 41,359
Int. Cl. C11d *1/12*, *3/30*; B01d *19/04*
U.S. Cl. 252—528 25 Claims



An anionic detergent composition having an inverse foam to temperature relationship is disclosed, as well as a composition for accomplishing this relationship when added to a detergent system. The inverse foam to temperature relationship is provided by a synergistic mixture of a fatty acid containing between about eight and 30 carbon atoms in the alkyl chain and a polyethoxylated mono fatty alkyl quaternary ammonium methosulfate, chloride, bromide, nitrate or sulfate salt having about 10 to 50 moles of ethylene oxide.

3,714,075

CHLORINATED HYDROCARBON COMPOSITIONS AND USES THEREOF

Peter Graham Johnson, Cheshire, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 23, 1970, Ser. No. 74,912
Claims priority, application Great Britain, Oct. 7, 1969, 49,275/69
Int. Cl. C11d *1/18*, *1/50*
U.S. Cl. 252—545 10 Claims

A composition for cleaning and drying articles comprising a chlorohydrocarbon solvent and a metal, ammonium or amine salt of an alkyl benzene sulphonic acid wherein the alkyl group contains from seven to 14 carbon atoms.

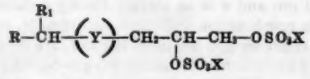
3,714,076

METHOD OF WASHING WITH LINEAR ALKYL VICINAL DISULFATES

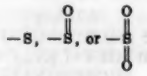
Robert G. Anderson, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Original application Aug. 5, 1970, Ser. No. 62,233, now Patent No. 3,651,119. Divided and this application Sept. 23, 1971, Ser. No. 183,239
Int. Cl. C11d *1/12*
U.S. Cl. 252—550 4 Claims

Method of washing fabrics in the absence of phosphate builders employing detergent active materials which comprise sulfur-linked linear alkyl vicinal disulfates of the formula:



in which Y is



R and R_1 are hydrogen or alkyl radicals having a total of from 9 to 23 carbon atoms, and X is hydrogen or a water-soluble salt-forming cation.

3,714,077

URETHANE FOAM CATALYST SYSTEM

David S. Cobbledick, Kent, and Arthur J. Norman, Tallmadge, Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Apr. 1, 1970, Ser. No. 24,817
Int. Cl. C08g *22/38*, *41/04*, *22/40*
U.S. Cl. 260—2.5 BE 10 Claims

Heat discoloration of polyurethane foams containing halogen-containing polymers such as polyvinyl chloride is reduced or prevented by the use of catalyst systems consisting of combinations of polyol-soluble organic stannous compounds with polyol-soluble organic bismuth and/or antimony compounds, optionally, with certain sterically hindered tertiary amines such as N-methyl dicyclohexyl amine.

3,714,078

FOAMABLE ACRYLIC LATEX COMPOSITION AND METHOD OF PREPARATION

Philip L. Gordon, Lexington, and Augustin La Torre, Burlington, Mass., assignors to General Latex and Chemical Corporation, Cambridge, Mass.

No Drawing. Continuation-in-part of application Ser. No. 683,828, Nov. 17, 1967. This application Sept. 16, 1970, Ser. No. 72,819
Int. Cl. C08f *47/08*, *37/18*, *15/42*
U.S. Cl. 260—2.5 L 31 Claims

A foamable latex composition and method of preparing the composition, the composition comprising an aqueous emulsion of a copolymer containing: a lower alkyl acrylate, a nitrile, an unsaturated carboxylic acid, an

amide and an aryl polyether alcohol surfactant as substantially the sole surfactant employed in the preparation of the aqueous emulsion. This latex composition when foamed, coated on a fabric, the foam crushed and cured provides a product with good hand, light-fastness, abrasion resistance and dry-clean characteristics.

3,714,079

DERIVATIVES OF PHENOLPHTHALEIN USED IN POLYURETHANE PREPARATION

Bruce N. Wilson, Heath, Ohio, and Raymond R. Hindersinn, Lewiston, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 115,870, Feb. 16, 1971, which is a continuation-in-part of application Ser. No. 694,076, Dec. 28, 1967, both now abandoned. This application Apr. 12, 1971, Ser. No. 133,447

Int. Cl. C08g *22/14*

U.S. Cl. 260—2.5 AQ **5 Claims**

Novel derivatives of phenolphthalein are prepared by reacting the compound with ammonia or an amine, and with ammonia or an amine, followed by a 1,2-epoxide. Such polyhydric derivatives of phenolphthalein are useful in the preparation of polyurethane compositions such as foams, coatings and elastomers, for the production of saturated alkyd resins, unsaturated polyesters, and as intermediates in the preparation of other polymer compositions.

3,714,080

POLYURETHANE FOAM RESIN STABILIZERS

Manfred Dahm, Bergisch-Neukirchen; Karl-Josef Kraft, Leverkusen, and Manfred Roegler, Bad Godesberg, all of Germany, assignors to Farbenfabriken Bayer Aktiengasellschaft, Leverkusen, Germany

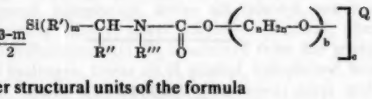
Filed June 9, 1971, Ser. No. 151,519

Claims priority, application Germany, June 13, 1970, P 20 29 293.7

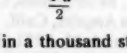
Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 AH **9 Claims**

Polyurethane foam resins having improved physical properties are produced by incorporating in the reaction mixture a siloxane modified carbamic acid derivative foam stabilizer having at least one structural unit of the formula



and other structural units of the formula



but in which at least one in a thousand structural units corresponds to the first mentioned formula, and

R′ represents an optionally halogenated or cyano-substituted C_1 to C_{10} alkyl, C_4 to C_{10} cycloalkyl or C_6 to C_{10} aryl radical,

R″ represents a hydrogen atom of a methyl or phenyl radical,

R‴ represents a C_1 to C_{10} alkyl, C_4 to C_{10} cycloalkyl, C_2 to C_{10} alkenyl, C_7 to C_{10} aralkyl, di-(C_1 — C_{10} alkyl)-amino—C_1—C_{10} alkyl, C_6 to C_{10} aryl or C_7 to C_{10} alkaryl radical,

Q represents a monovalent to hexavalent saturated C_1 to C_6 alkyl radical, or a monovalent to trivalent C_6 aryl radical,

$m = 0$, 1 or 2,

$n = 2$, 3 or 4,

$a = 0$, 1, 2 or 3,

b represents an integer of 1 to 200, and

c represents the valency of Q,

the radicals and numerical values at each position of a molecule being chosen independently of the others.

3,714,081

NOVEL INTUMESCENT COATING COMPOSITION

Shirley H. Roth, Highland Park; Joseph Green, East Brunswick, both of N.J., and John J. Seipel, Ambler, Pa., assignors to Cities Service Company, New York, N.Y.

Filed May 15, 1972, Ser. No. 253,590

Int. Cl. C08j *1/20*

U.S. Cl. 260—2.5 FP **2 Claims**

Melamine pyrophosphate is used to improve the homogeneity, and thus the effectiveness, of the foamed char produced by the intumescence of p,p′-oxybis(benzenesulfonamide) in a vinyl chloride/vinylidene chloride copolymer binder.

3,714,082

INTUMESCENT COATING COMPOSITION

Shirley H. Roth, Highland Park, and Joseph Green, East Brunswick, N.J., and John J. Seipel, Ambler, Pa., assignors to Cities Service Company, New York, N.Y.

No Drawing. Filed May 15, 1972, Ser. No. 253,584

Int. Cl. C08 *1/20*

U.S. Cl. 260—2.5 FP **2 Claims**

Dipentaerythritol is used to improve the homogeneity, and thus the effectiveness, of the foamed char produced by the intumescence of p,p′-oxybis(benzenesulfonamide) in a vinyl chloride/vinylidene chloride copolymer binder.

3,714,083

METHOD FOR PRODUCING FOAMED ARTICLE FROM POLYPROPYLENE

Yujiro Nakayama; Tadayuki Fukada, and Masayuki Ogawa, all of Yokkaichi-shi, Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1969, Ser. No. 790,858

Claims priority, application Japan, Jan. 12, 1968, 43/1448

Int. Cl. C08f *47/10, 19/20, 1/16*

U.S. Cl. 260—2.5 HA **8 Claims**

A method of producing a foamed article having a uniform cellular structure using a modified polypropylene produced by irradiating polypropylene with an ionizing radiation of from 0.1 to 5.0 megarad and graft-copolymerizing the irradiated polypropylene with from 0.5 – 6 percent by weight divinyl benzene or with from 0.5 – 6 percent by weight of divinyl benzene and not more than 10 percent by weight of an acrylic acid ester.

3,714,084

BAGASSE REINFORCED RESIN BODIES AND METHOD OF MAKING SAME

Roland Botz, San Juan, Puerto Rico, assignor to Plasti-Fiber Formulations, Inc., Mercedita, Puerto Rico

Application Oct. 9, 1969, Ser. No. 866,123, now Patent No. 3,694,308, which is a continuation-in-part of abandoned application Ser. No. 758,903, Sept. 10, 1968. Divided and this application Nov. 2, 1970, Ser. No. 86,321

Int. Cl. C08g *45/18, 51/18*

U.S. Cl. 260—9 **3 Claims**

Bagasse is treated with an aqueous solution of alum and defibrated to give a fibrous product suitable for the reinforcement of resin bodies. The fiber can also be pulverized to yield a flour suitable for use as a filler in resin bodies. The treatment also produces a clean, sugar free, moisture resistant, low density cellular pith material suitable for manufacturing insulation and acoustical materials, as a filler for synthetic foam products, and as a filler for animal feed formulations.

3,714,085

SILICA-UREA FORMALDEHYDE POLYMER COMBINATION FLATTING ADDITIVE COMPOSITION

Gregor Berstein, Newton, John F. Hardy, Andover, and Leonard H. Doppler, Lexington, Mass., assignors to Cabot Corporation, Boston, Mass.

No Drawing. Filed Oct. 12, 1971, Ser. No. 188,563
Int. Cl. C08g *51/04*; C08h *17/02*
U.S. Cl. 260—39 SB 5 Claims

This disclosure relates to the use of a combination of non-porous materials comprising a certain group of urea-formaldehyde polymers and a certain group of pyrogenically prepared colloidal silicas as flatting additives in the preparation of flatted compositions such as paints, lacquers, varnishes and the like.

3,714,086

COATING COLORS CONTAINING SATIN WHITE WITH GOOD VISCOSITY STABILITY

Horst Schaefer, Frankfurt am Main, and Helmut Neises, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 31, 1967, Ser. No. 627,317
Claims priority, application Germany, Apr. 7, 1966, F 48,890
Int. Cl. C08f *45/04*
U.S. Cl. 260—17 R 8 Claims

Coating colors containing satin white, a liquefier and polyvinyl alcohol and process for preparing same.

3,714,087

POWDERED RESORCINOL-FORMALDEHYDE TREATED POLYSACCHARIDE-REINFORCED ELASTOMER MASTERBATCHES, COMPOUNDS, AND RESULTING VULCANIZED RUBBERS

Russell A. Buchanan, and Charles R. Russell, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture

Division of Ser. No. 58,187, July 24, 1970, Pat. No. 3,673,136. This application Feb. 28, 1972, Ser. No. 230,098
Int. Cl. C08c *9/12*; C08f *45/14*
U.S. Cl. 260—17.2 6 Claims

Powdered elastomer masterbatches are prepared by grinding dried rubber curds which contain highly effective reinforcing agents. Such finely comminuted elastomer masterbatches provide stable powdered rubber compounds when blended with usual powdered curatives and fine particle fillers. These powdered rubber compounds are formed into finished vulcanized rubber articles by direct heat-compression molding, by extrusion from a simple machine, or by injection molding without prior high shear mixing.

3,714,088

PROCESS FOR THE PRODUCTION OF LATEX COATED CYANAMIDE-FORMALDEHYDE MODIFIED CELLULOSIC PULP FIBERS

James H. Manning, Monroe, N.Y., assignor to Imperial Paper Company, New York, N.Y.

Filed Feb. 24, 1971, Ser. No. 118,537
Int. Cl. C08d *9/06*; C08f *45/18*; C08g *51/18*; D06m *1/00*; D21h *3/22*
U.S. Cl. 260—17.3 25 Claims

A process for producing polymeric coated cellulosic fibers which comprises reacting cellulosic fibers in an aqueous alkaline medium with cyanamide and then reacting the cyanamide modified cellulose with formaldehyde to form a cyanamide-formaldehyde condensation polymer and then sorbing a latex emulsion onto said fiber. The presence of a soluble reducing sugar is necessary in either the cyanamide reaction or the formaldehyde reaction and the cyanamide reaction must precede the formaldehyde reaction.

3,714,089

CURABLE COMPOSITIONS

Stephen B. Hamilton, Schenectady; Melvin D. Beers, Ballston Lake; Abe Berger, and Terry G. Selin, both of Schenectady, all of N.Y., assignors to General Electric Company

Filed May 4, 1970, Ser. No. 34,584
Int. Cl. C08h *9/00*
U.S. Cl. 260—18 S 43 Claims

Room temperature vulcanizing silicone elastomers are prepared by the addition of a novel, fluid at room temperature, cross linking agent such as acetoxyethyltriacetoxysilane to a silanol chain-stopped polydiorganosiloxane fluid. These compositions are stable, free flowing fluids in the absence of moisture but cure to the rubbery, solid elastic state upon exposure to moisture. The compositions are particularly useful in bonding windshields to a supporting structure in automobiles.

3,714,090

HIGH TEMPERATURE POLYESTER COATING COMPOSITION

Edward A. Lasher, Beverly Hills, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed March 22, 1971, Ser. No. 126,975
Int. Cl. C09d *3/52*, *3/66*
U.S. Cl. 260—21 9 Claims

A polyester coating composition is produced by heating a reaction mixture comprising (a) 17—24 percent by weight of a fatty acid, (b) 30—42 percent of a polyol moiety consisting of 45—70 percent of a triol with the remainder being diol, and (c) 40—56 percent of a polycarboxylic acid moiety consisting of 83—93 percent of an aromatic polycarboxylic acid with the remainder being an aliphatic polycarboxylic acid, to a temperature, generally between 400° and 480°F, and for a time sufficient to esterify the reactants. Preferably, this coating composition is reacted with an aminoplast resin to cause cross-linking to produce a hard, flexible paint which is capable of withstanding high temperatures without noticeable discoloration and which is particularly useful for coil coating.

3,714,091

OIL-CONTAINING POLYESTER COATING

Edward A. Lasher, Beverly Hills, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed March 22, 1971, Ser. No. 126,951
Int. Cl. C09d *3/52*, *3/66*
U.S. Cl. 260—21 10 Claims

A hard, flexible modified polyester coating is formed from a polyester resin which is made by (1) heating a mixture of a fat and a triol preferably in the presence of a catalyst until the ensuing transesterification reaction is substantially complete and (2) heating the product of (1) with a diol and a combination of aromatic and aliphatic polybasic carboxylic acids until the latter reaction is substantially complete. This polyester resin is blended with an aminoplast resin to produce a modified polyester resin composition which cures to a hard, yet flexible coating. Additional triol may be included in step (2). The weight of each of the above components in the total reaction mixture (1) plus (2) is: fat 20–25 percent; polyol 30–40 percent with the amount of triol comprising 45–70 percent of the polyol; and polycarboxylic acids - 40–56 percent with the aromatic polycarboxylic acid constituent comprising 83–92 percent of the polycarboxylic acid constituent.

3,714,092

SULFUR-CURED POLYURETHANES BASED ON A POLYESTER PREPARED FROM AZELAIC ACID, DIMER ACID AND LOWER ALKANE GLYCOLS

Michael P. Mazzeo, Highstown, N.J., and Anthony F. Santaniello, Newtown, Pa., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Continuation-in-part of Ser. No. 858,877, Sept. 17, 1969, abandoned. This application July 27, 1971, Ser. No. 166,586

Int. Cl. C08g 22/10, 17/16

U.S. Cl. 260—22 TN 1 Claim

Sulfur-curable polyester urethane crude rubbers having improved hydrolysis resistance and excellent properties when exposed to low temperatures over a long period of time are prepared by the reaction of an organic diisocyanate with a polyester prepared from an acid mixture having 90/10 to 97/3 preferably 94/6 mole ratio of azelaic acid to a long chain dibasic acid and a polyol mixture having a 65/35 to 75/25 preferably 70/30 mole ratio of 1, 4-butanediol to propylene glycol followed by chain extension with a polyol having pendant aliphatic unsaturation.

3,714,093

SPIRO [HETEROCYCLOALKYL-2'(1'H)-QUINAZOLINE]-4'(3'H)-ONES

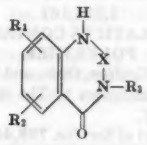
Milton Wolf, West Chester, and James L. Diebold, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 19, 1970, Ser. No. 38,910

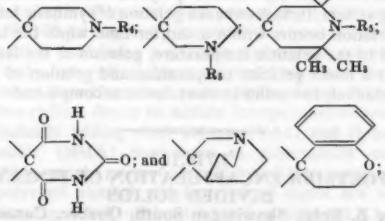
Int. Cl. C07d 51/48

U.S. Cl. 260—251 QA 10 Claims

This invention relates to spiro[heterocycloalkyl-2'(1'H)-quinazolin]-4'(3',H)-ones having the formula:



wherein R_1 and R_2 are selected independently from the group consisting of hydrogen, halogen, lower alkyl, phenyl(lower)-alkyl, phenyl, halophenyl, lower alkylphenyl, lower alkoxyphenyl, lower alkoxy, lower alkylthio, phenoxy, phenthio, nitro and trifluoromethyl; R_3 is selected from the group consisting of hydrogen, lower alkyl, phenyl, halophenyl, lower alkylphenyl, lower alkoxyphenyl, phen(lower)alkyl and X is selected from the group consisting of



wherein R_4 and R_5 are selected from the group consisting of hydrogen, lower alkyl, phen(lower)alkyl, halophenyl(lower)alkyl, lower alkylphenyl(lower)alkyl and lower alkoxyphenyl(lower)alkyl. The compounds exhibit anti-amebic activity.

3,714,094

STRIPPABLE WAX COATING COMPOSITIONS

Dominic Apikos, Park Forest, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Application Jan. 12, 1970, Ser. No. 2,383, which is a division of application Ser. No. 556,555, June 10, 1966. Divided and this application Dec. 13, 1971, Ser. No. 207,699

Int. Cl. C08f 45/52

U.S. Cl. 260—28.5 AV 13 Claims

This invention relates to a strippable wax coating containing an ethylene-vinyl acetate polymeric composition and a stripping agent which is either an N-substituted fatty acid amide or a nitrogen containing compound containing a fatty acid residue. Particularly preferred are wax compositions which contain as the stripping agent an N-substituted fatty acid amide containing a fatty acid residue having from 10 to 17 carbon atoms. The compositions can also contain minor amounts of a mineral oil to increase the strippability.

3,714,095

COARSELY DISPERSED, SEDIMENTING AQUEOUS POLYURETHANE DISPERSIONS

Artur Reischl, and Dieter Dieterich, both of Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 671,197, Sept. 28, 1967, abandoned. This application Jan. 12, 1971, Ser. No. 105,982

Claims priority, application Germany, Oct. 1, 1966, F 50 344

Int. Cl. C08g 41/04, 51/24; C08j 1/48

U.S. Cl. 260—29.2 TN 2 Claims

Coarse, aqueous dispersions of polyurethanes that sediment but are capable of being redispersed are prepared from 40 to 99.5 percent by weight of a polyurethane polymer having a molecular weight greater than 5,000 and preferably above 20,000 which is free of salt-forming groups and from about 0.5 to about 60 percent by weight of a polyurethane polymer containing salt-forming groups. Salt formation is permitted to occur until 0,0007 to 0,011 equivalent percent has taken place and the mixture is then dispersed at least in a quantity of water such that the solids content is 60 percent.

3,714,096

SELF-CROSSLINKING VINYL ACETATE LATICES

Giovanni Biale, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Sept. 3, 1970, Ser. No. 69,478

Int. Cl. C08g 51/24; C09d 5/02

U.S. Cl. 260—29.4 UA 19 Claims

An aqueous latex of a vinyl ester polymer is described which has the property of forming self-curing films without the use of an extraneous curing additive. The latex is useful as a binder, particularly for non-woven fibers, or for wood panel coating or textile coating. The polymer comprises a major proportion of a vinyl ester monomer, typically vinyl acetate, which is interpolymerized with polymerizable comonomers comprising a film-forming-temperature regulating amount of a comonomer, typically an acrylate ester, a minor amount of cross-linking reactive comonomers, typically N-methylolcrylamide and a cure catalyzing amount of an ethylenically mono-unsaturated carboxylic acid such as acrylic acid. In a preferred embodiment, a minor amount of a synergistic, second cross-linking agent is used such as diallyl maleate. The polymer is dispersed in an aqueous emulsion using an anionic or nonionic surfactant or mixtures thereof, typically a mixture of an alkaryl polyether alcohol and an alkali metal sulfosuccinate half ester of an ethoxylated alcohol.

3,714,097

PROCESS FOR PRODUCING LOW FOAMING LATEXES OF INTERPOLYMERS CONTAINING VINYL CHLORIDE AND ETHYLENE

Philip A. Cautilli, Feasterville, Pa., and Samuel J. Makower, Wyncote, Pa., assignors to Borden Inc., New York, N.Y.

Filed June 8, 1970, Ser. No. 44,667
Int. Cl. C08f *1/13*, *15/02*
U.S. Cl. 260—29.6 RB 12 Claims

This invention relates to stable vinyl chloride/ethylene interpolymer latexes polymerized at between about 50 and 15,000 psi., which latexes can be removed from said reactors without the usual venting difficulties of foaming, coagulation and valve clogging. The method of making said latexes comprises gradually adding comonomer including a major proportion of vinyl chloride over a period of at least six hours, to an aqueous composition maintained under ethylene pressure and containing a seed latex, a free-radical initiating system and an amount of emulsion stabilizer below that which will cause substantial foaming.

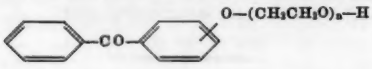
3,714,098

PROCESS FOR THE MANUFACTURE OF AQUEOUS DISPERSIONS OF VINYL ESTERS

Karl Josef Rauterkus, Kelkheim/Taunus, and Detlev Seip, Konigstein/Taunus, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Continuation-in-part of Ser. No. 679,535, Oct. 31, 1967, abandoned. This application June 26, 1970, Ser. No. 50,294
Claims priority, application Germany, Nov. 8, 1966, F 50 623
Int. Cl. C08f *1/13*
U.S. Cl. 260—29.6 RW 7 Claims

A process for the production of aqueous dispersions of polymers of vinyl esters by emulsion-polymerizing at least one vinyl ester and/or an ester of acrylic acid and/or an ester of methacrylic acid in the presence of light-sensitive emulsifiers of the formula



said polymers giving cross-linked products under the action of light of a wave-length of from 2,000 to 8,000 A.

3,714,099

SELF-CROSSLINKING VINYL ACETATE-ETHYLENE LATEXES

Giovanni Biale, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sept. 3, 1970, Ser. No. 69,438
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.67 TA 17 Claims

An aqueous latex of a vinyl ester polymer is described which has the property of forming self-curing films without the use of an extraneous curing additive. The latex is useful as a binder, particularly for non-woven fibers, or for wood panel coating or textile coating. The polymer comprises a major proportion of a vinyl ester monomer, typically vinyl acetate, which is interpolymerized with ethylene, a minor amount of a synergistic combination of cross-linking reactive comonomers, typically N-methylolacrylamide and diallyl maleate, and a cure-catalyzing amount of an ethylenically mono-unsaturated carboxylic acid such as acrylic acid. The polymer is dispersed in an aqueous emulsion using an anionic or nonionic surfactant or mixtures thereof, typically a mixture of an alkaryl polyether alcohol and an alkali metal sulfosuccinate half ester of an ethoxylated alcohol.

3,714,100

CROSSLINKABLE VINYL ACETATE LATICES

Giovanni Biale, Placentia, and Richard L. Pilling, Fullerton, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Sept. 3, 1970, Ser. No. 69,470
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 TA 25 Claims

An aqueous latex of a vinyl ester polymer is described which has the property of forming crosslinkable films upon the addition of an extraneous curing additive. The latex is useful as a binder, particularly for non-woven fibers, or for wood panel or textile coating. The polymer comprises a major proportion of a vinyl ester monomer, typically vinyl acetate, which is interpolymerized with polymerizable comonomers comprising a film-forming-temperature regulating amount of a comonomer, typically ethylene or an acrylate ester, and a minor amount of a synergistic combination of crosslinking reactive comonomers, typically diallyl maleate with N-methylolacrylamide. Treatment of the latex to reduce its pH, e.g., by addition of an acidic agent, imparts crosslinking activity to films prepared from the latex. The polymer is dispersed in an aqueous emulsion using an anionic or nonionic surfactant or mixtures thereof, typically a mixture of an alkaryl polyether alcohol and an alkali metal sulfosuccinate half ester of an ethoxylated alcohol.

3,714,101

HEAT SENSITIVE LATICES CONTAINING SILICONE POLYETHER

Donald P. Knechtges, Grafton, Ohio, and George J. Antlfinger, Avon Lake, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Continuation-in-part of Ser. No. 798,466, Feb. 11, 1969, abandoned. This application Oct. 21, 1970, Ser. No. 82,789
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 RW 10 Claims

Synthetic latices are made heat-sensitive by the presence in the latex of a silicone polyether. The use of an organosulfonate in combination with a silicone polyether as a heat-sensitizing system for synthetic latices produces a heat-sensitive latex that is relatively stable at room temperature but that may be converted to a gel at a moderately low temperature and the silicone polyether may be used in significantly reduced amounts to impart heat-sensitivity to the latex as compared to the amounts of silicone polyether required as the heat-sensitizing additive without this additive. Organic acids when used in conjunction with the silicone polyether-sulfonate heat-sensitizing system, further enhance gelation of synthetic latices in that gelation occurs within a shorter time when the latex is heated to the gelation temperature, gelation of the latex occurs at a lower gelation temperature and gelation of latices with relatively low solids content can be accomplished.

3,714,102

POLYMER ENCAPSULATION OF FINELY DIVIDED SOLIDS

Walter B. Reiss, Shawinigan South, Quebec, Canada, assignor to Gulf Oil Canada Limited, Toronto, Ontario, Canada

No Drawing. Filed Dec. 2, 1970, Ser. No. 94,571
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 R 13 Claims

A process is disclosed for the encapsulation of a finely divided inorganic solid, dispersed in aqueous medium, with

polymer by in situ polymerization. The process depends on establishing a cationic charge on the dispersed solid followed by polymerization, under specified conditions, of monomer in the aqueous medium in the presence of the solid. If desired, emulsified polymer can be formed in the aqueous medium after encapsulation of the finely divided solid has been completed.

3,714,103

SUSPENSION POLYMERIZATION OF VINYLIDENE HALIDE IN PRESENCE OF POLYVINYLIDENE HALIDE STABILIZER

Helmut Huhn, Walsrode, and Horst Kuhn, Fallingbostel, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

No Drawing. Filed Sept. 8, 1970, Ser. No. 70,513
Claims priority, application Germany, Sept. 11, 1969, P 19 45 970.2
Int. Cl. C08f *15/06, 15/40*
U.S. Cl. 260—29.6 RB **3 Claims**

A process for the continuous production of solid polyvinylidene halide resins which comprises the copolymerisation of a mixture of starting materials such as vinylidene halides, acrylonitrile, acrylic acid, methacrylic acid, itaconic acid and catalysts and emulsifiers together with a polymerised component of a solid polyvinylidene halide resin obtained by emulsion polymerisation by means of freezing coagulation.

3,714,104

AQUEOUS COATING COMPOSITION COMPRISING A POLYBLEND OF E/VC/A AND POLYACRYLAMIDE

Joseph G. Bergomi, Jr., 4 Cool Meadows, St. Louis, Mo.

Filed Jan. 5, 1971, Ser. No. 104,147
Int. Cl. C08f *37/18*
U.S. Cl. 260—29.6 WB **9 Claims**

Aqueous composition comprising a mineral pigment and a polyblend of ethylene/vinyl chloride/acrylamide interpolymer and a polyacrylamide useful as an inorganic paper coating composition.

3,714,105

ADHESIVE LATEXES OF VINYL ACETATE/ETHYLENE/N-METHYLOLACRYLAMIDE TERPOLYMERS

Peter Fallon Stehle, Media; Chan K. Wu, Levittown, both of Pa.; Samuel Loshaek, Stamford, Conn., and Jack Dickstein, Huntington Valley, Pa., assignors to Borden Inc., New York, N.Y.

Continuation-in-part of Ser. No. 874,410, Nov. 5, 1969, Pat. No. 3,644,262. This application Feb. 8, 1971, Ser. No. 113,766
Int. Cl. C08f *45/22, 1/13*
U.S. Cl. 260—29.6 WA **5 Claims**

Latex adhesives with excellent resistance to cold flow and peel are prepared by a method comprising (a) maintaining about 50–300 psi ethylene pressure on an aqueous emulsifying composition containing a partially hydrolyzed polyvinyl alcohol and a free-radical donor selected from alkali metal and ammonium persulfates and peroxydiphosphates, (b) causing said free-radical donor to initiate interpolymerization while (c) gradually adding vinyl acetate (VAc) and N-methylol acrylamide (NMA) monomers in substantially constant NMA/VAc weight ratio of about 0.5 to 2.0 percent, wherein said polyvinyl alcohol and free-radical donor are used in amounts respectively of about 2.5–8.0 percent and 0.5–2 percent based on the total weight of vinyl acetate used and wherein the rates of monomer addition are sufficient to cause interpolymerization of the vinyl acetate, ethylene and NMA, but insufficient to permit the quantity of unpolymerized vinyl acetate in the aqueous composition to rise higher than about 3.5 percent by weight of the composition during the preparation of at least 75 percent of said interpolymerization.

3,714,106

VINYLIDENE CHLORIDE COPOLYMER

David R. Smith and Howard Peterson, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of application Ser. No. 819,956, Apr. 28, 1969. This application Oct. 21, 1969, Ser. No. 868,209
Int. Cl. C08f *37/00, 15/40*
U.S. Cl. 260—29.6 TA **12 Claims**

A polyvinylidene chloride latex composition suitable for coating substrates comprising a copolymer of (A) 70 to 95% by weight vinylidene chloride, (B) 0.5 to 30% by weight hydroxyalkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid, (C) 0 to 3% by weight ethylenically unsaturated sulfur acid having sulfur in valence state 6, (D) 0 to 5% by weight ethylenically unsaturated carboxylic acid and (E) 0 to 29.5% by weight ethylenically unsaturated monomer other than (A), (B), (C) or (D).

3,714,107

HIGH SOLIDS COATING COMPOSITION

Johanna Wilhelmina V. O. Smith, Cape Elizabeth, Maine, assignor to The Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 733,173, May 29, 1968, Pat. No. 3,578,493. This application Dec. 9, 1970, Ser. No. 96,564
Int. Cl. C08d *7/02;* **D21h** *1/28, 1/30*
U.S. Cl. 260—29.7 SQ **7 Claims**

Disclosed is an aqueous paper coating composition having a solids content of at least 70 percent by weight with said solids being comprised of a coarse ground substantially spherical pigment, a finely divided pigment and coating binder; said coarse ground pigment comprising from 25 to 90 percent of the total pigment content with the finely divided pigment comprising the remainder of the pigment composition. Also disclosed is a process for applying the new paper coating composition and a glossy coated paper product.

3,714,108

MIXTURES OF MOULD PARTING AGENTS FOR POLYAMIDE MOULDING COMPOSITIONS

Karl-Heinz Hermann and Kurt Schneider, Krefeld-Bockum, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 22, 1970, Ser. No. 30,937
Claims priority, application Germany, Apr. 26, 1969, P 19 21 364.0
The portion of the term of the patent subsequent to Nov. 17, 1987, has been disclaimed
Int. Cl. C08g *51/38, 51/42;* **C08r** *1/44*
U.S. Cl. 260—31.4 R **8 Claims**

Polyamide moulding materials which can be more easily removed from the mould are obtained by adding to the polyamides a combination consisting of (a) a mould parting agent A which has an emulsifying action and is compatible with the polyamide, and (b) a mould parting agent B which is incompatible with the polyamide.

3,714,109

PRIMER ADHESION PROMOTER AND PRIMER COMPOSITION

James E. Matherly, Elizabethtown, Ky., and William R. Hays, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed June 24, 1971, Ser. No. 156,550
Int. Cl. C08g *51/34*
U.S. Cl. 260—32.8 SB **10 Claims**

A mixture of an organosiloxane of four to 20 silicon atom and containing at least three silicon-bonded hydrogen atoms and a modified organosiloxane of five to 21 silicon atoms and containing an average of one unit of $(CH_3COO)_2SiCH_2CH_2(CH_3)SiO$ or $(CH_3COO)_2SiCH_2CH_2(CH_3)_2SiO$ and at least two silicon-bonded hydrogen atoms is an adhesion promoter in primer compositions for adhering silicone elastomers to substrates.

3,714,110

OIL EXTENDED POLYURETHANES BASED ON HYDROXY TERMINATED DIENE POLYMERS

Joseph A. Verdol, Dolton, Patrick W. Ryan, Chicago Heights, and Donald J. Carrow, Riverdale, Ill., assignors to Atlantic Richfield Company

No Drawing. Continuation of application Ser. No. 751,691, Aug. 2, 1968, which is a continuation of application Ser. No. 465,161, June 18, 1965, both now abandoned. This application Jan. 22, 1971, Ser. No. 109,059

Int. Cl. C08g 51/52

U.S. Cl. 260—33.6 AQ 23 Claims

Oil-extended, solid urethane elastomers are made from polyisocyanates and polyhydroxy diene polymers, preferably having at least 2.1 predominantly primary, allylic, terminal hydroxyl groups per molecule, and essentially hydrocarbon extender agents. The urethane elastomer is formed in the presence of the extender agent and the polyhydroxy polymer may be a diene homopolymer, for instance, of butadiene, or a copolymer of the diene and an alpha-mono-olefinic monomer of 2 to 12 carbon atoms. The polyhydroxy polymer is of relatively low molecular weight and preferably has greater than 50% of its unsaturation in the main hydrocarbon chain, for instance, about 50 to 65% trans-1,4-unsaturation and about 15 to 25% cis-1,4-unsaturation. The elastomers can be mixed with various fillers including carbon black and silica and may contain urea linkages. Preferred extending agents are mineral oils having a viscosity of about 100 to 600 SSU at 100° F.

3,714,111

ABLATIVE COMPOSITES CONTAINING NOVOLAC FIBERS

James Economy, Eggertsville, and Rodger A. Clark, Youngstown, both of N.Y., assignors to The Carborunbum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 764,731, Oct. 3, 1968, abandoned. This application Aug. 31, 1970, Ser. No. 68,577

Int. Cl. C08k 1/80

U.S. Cl. 260—38 7 Claims

A composite comprising a charrable resin or plastic reinforced by fibers prepared from the resin condensation products of phenols and aldehydes which can be fiberized and cured.

3,714,112

GLYCIDYL ACETATE AS VISCOSITY MODIFIER FOR LIQUID EPOXY RESINS

Hugo Stange, Princeton, N.J., assignor to FMC Corporation, New York, N.Y.

Filed April 15, 1971, Ser. No. 134,441

Int. Cl. C08g 51/32

U.S. Cl. 260—30.4 EP 4 Claims

A fluidized resinous composition comprising (1) a liquid epoxy resin and (2) glycidyl acetate as a viscosity control agent therefor. Also described are the cured products formed therefrom.

3,714,113

THERMOSETTABLE RESIN-BASED MOULDABLE FACING COMPOUNDS

Alan Cyril Kingston, Pickering, Ontario, Canada, assignor to The Granure Corporation Limited, Toronto, Ontario, Canada

No Drawing. Filed Dec. 1, 1969, Ser. No. 881,342

Claims priority, application Great Britain, Nov. 29, 1968, 56,774/68

Int. Cl. C08g 51/04

U.S. Cl. 260—40 R 13 Claims

A coating composition and its method of application for use on masonry units such as concrete building blocks having improved flame-spread retardance and low smoke production ratings comprising of from 60% to about 90% by weight of a water-insoluble siliceous filler and at least about 5% by weight of a particulate hydrated alumina or aluminum silicate in from about 10% to about 40% by weight of unsaturated polyester resins.

3,714,114

MELAMINES AS LIGHT STABILIZERS IN TITANIUM DIOXIDE PIGMENTED POLYMERS

Joseph Anthony Stretanski, Clinton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

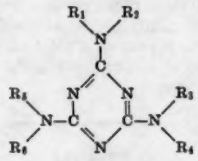
Continuation of Ser. No. 771,274, Oct. 28, 1968, abandoned. This application March 30, 1971, Ser. No. 129,610

Int. Cl. C08f 45/04, 45/60

U.S. Cl. 260—41 B 2 Claims

A polymeric composition stable against ultraviolet light comprising (a) a polymer selected from the group consisting of poly(vinyl chloride), polystyrene and polyolefins; (b) titanium dioxide and (c) a melamine of the formula

I.



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are individually selected from the group consisting of hydrogen, alkyl of one to 12 carbon atoms, alkenyl of up to three carbon atoms, hydroxyalkyl of one to six carbon atoms, monocarbocyclic aryl, and together one pair of R groups on each nitrogen atom can comprise a five or six member hetero-ring.

3,714,115

ELASTOMERIC COMPOSITION OF NEOPRENE, POLYETHER POLYPRIMARY POLYAMINE AND A BASIC CURING AGENT

Nelson Jonnes, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 2, 1970, Ser. No. 86,285

Int. Cl. C08d 9/10

U.S. Cl. 260—41.5 A 12 Claims

Curable elastomeric compositions comprising neoprene, at least one neoprene curing agent, and a polyether polyprimary polyamine having a polyether moiety containing recurring oxyalkylene groups in which the alkylene has from two to six carbon atoms, said polyether polyprimary polyamine having a molecular weight of at least about 3500 and cured products obtained therefrom.

3,714,116

POLYIMIDE COMPOSITIONS

Emanuele Scalco, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

No Drawing. Filed Apr. 8, 1970, Ser. No. 26,796

Int. Cl. C08g 51/58, 51/60

U.S. Cl. 260—45.9 R 7 Claims

This application relates to compositions comprising polyimides susceptible to oxidation and a tertiary phosphine oxide. Also the application is directed to an antioxidant composition comprising a phosphite antioxidant, a phenolic antioxidant and a tertiary phosphine oxide and mixtures of such antioxidant compositions with polyimide.

3,714,117

THERMALLY STABILIZED FLUOROKETONE/VINYL FLUORIDE COPOLYMERS

Edward George Howard, Jr., Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 29, 1970, Ser. No. 102,522
Int. Cl. C08f *45/56, 45/58, 45/60*
U.S. Cl. 260—45.9 R 12 Claims

Copolymers of vinyl fluoride and fluoroketones can be stabilized against thermal degradation by treating them with a basic organo nitrogen or phosphorus compound having a $pK_a \geq 2.5$.

3,714,118

ORGANOSILICON COMPOUNDS

Grish Chandra; William John Owen, both of Penarth; Norman Cecil Lloyd, Radyr, and Bryan Ewart Cooper, Bridgend, all of Wales, assignors to Midland Silicones Limited, Reading, England

Filed Nov. 8, 1971, Ser. No. 196,329
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 UA 3 Claims

Organosilicon compounds, polymers and copolymers have been prepared containing acetylenic linkages between adjacent silicon atoms. The basic compounds are defined by the general formula $R'(R_2Si)_m(C \equiv C)—(C \equiv C)—(SiR_2)_nR''$ where R′ and R″ are H, halogen, hydrocarbonoxy or $—NO_2$ as above defined, monovalent hydrocarbon or monovalent halogenohydrocarbon, *m* is 1 to 4, *n* is 0 to 4, R″being H, alkyl, aryl or trihydrocarbylsilyl when *n* is O. The polymers can be defined by the unit formula ($OSiR_2—C \equiv C—C \equiv C—SiR_2—$) and may be copolymers containing units of the formula $Q_aSiO_{4-a/2}$ where Q is monovalent hydrocarbon or halogenohydrocarbon and *a* is 0 to 3.

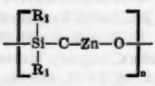
3,714,119

ZINC-SILOXANE POLYMER AND COATING AND METHOD FOR MAKING THE SAME

Burton S. Marks, Palo Alto, Calif., and Peter J. Chiesa, Jr., West Grove, Pa., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

No Drawing. Continuation-in-part of application Ser. No. 551,398, May 19, 1966. This application Dec. 12, 1968, Ser. No. 786,816
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 E 14 Claims

A zincphenylsiloxane polymer made by reacting a zinc salt such as anhydrous zinc acetate with a difunctional diphenylsiloxane monomer such as diphenyldialkoxysilane or with a trifunctional or polyfunctional silane polymer, such as the anhydrous hydrolysis and alcoholysis product of phenyltrichlorosilane, using heat sufficient to insure that reaction occurs (about 200° C.) which can be noted by the distillation of alkyl acetate, a by-product of the reaction. The functionality of the silane monomer in the above difunctional polymer is 2, in that it reacts through its two alcoholate groups to form the ordered-sequence copolymer polyzincphenylsiloxane having the repeated bonding:



where R_1 is a phenyl group and *n* is greater than 2. The zincphenylsiloxane copolymers prepared from dimers, trimers, tetramers, pentamers, and hexamers of the anhydrous hydrolysis and alcoholysis product of phenyltrichlorosilane also have all the zinc ions in between (O—Si—O) groups, but need not be strictly in ordered sequence if there are additional interspersed (O—Si—O) groups. These polymeric reactants all have a functionality greater than 2 when reacting with anhydrous zinc acetate. The zincphenylsiloxane polymer may thereafter be blended with a non-migrating plasticizer and coreactant silicone monomer and cured.

3,714,120

COMPOSITION AND METHOD OF INCREASING THE REACTION RATE BETWEEN AN EPOXY RESIN AND AN AROMATIC AMINE

Santokh S. Labana, Dearborn Heights, and Yun Feng Chang, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed April 13, 1971, Ser. No. 133,706
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EC 10 Claims

A material which produces carboxylate radicals upon decomposition is added to a mixture of an epoxy resin and an aromatic amine in order to catalyze the same. When the mixture is heated to a temperature sufficient to decompose the catalyst material, the reaction rate between the epoxy resin and the aromatic amine is increased over that which would occur without such a catalyst material.

3,714,121

ARYLAMINE-MODIFIED PHENOLIC RESOLE RESINS

Erwin H. Kobel and Harry A. Smith, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 29, 1971, Ser. No. 138,746
Int. Cl. C08g *5/18*
U.S. Cl. 260—51.5 14 Claims

Phenol-aldehyde resins are modified by reaction with aniline or a substituted aniline and a difunctional arylamine such as m-hydroxyaniline in specified proportions. The resinous products combine fast curing with good physical properties as wood adhesives. Cure time of the resins is conveniently adjusted by varying the proportions of formaldehyde and a polyepoxide in a mixed curing agent composition.

3,714,122

ANTIOXIDANTS AND AGE RESISTANT POLYMERIC COMPOSITIONS

Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 20, 1970, Ser. No. 56,635
Int. Cl. C08f *15/02, 45/58*; C07c *49/20*
U.S. Cl. 260—62 16 Claims

Antioxidants such as 3,5-di tert.butyl-4-hydroxycinnamonitrile and ethyl 3,5-di tert.hexyl-4-hydroxycinnamate, age resistant polymers having monomeric age resistors physically combined therewith and age resistant polymeric compositions prepared by free radical polymerization techniques involving the use of said antioxidants as monomers.

3,714,123

PROCESS FOR MAKING ETHYLENE POLYMERS OR COPOLYMERS IN A PRESSURE-PULSED TUBULAR REACTOR

Corrado Mancini, and Raffaele Gaspari, both of Milan, Italy, assignors to Societa Italiana Resine S.p.A., Milan, Italy

Filed Dec. 7, 1970, Ser. No. 95,743
Int. Cl. C08f *1/60, 3/04, 15/00*
U.S. Cl. 260—63 R 13 Claims

Ethylene polymers or copolymers are produced in elongated reactors in which the pressure is pulsated in known manner by intermittent discharge but in which a constant partial discharge is maintained also, with the effect of improving control over reaction conditions.

3,714,124
DIMETHYLOL PROPIONIC ACID-UREA-ALDEHYDE RESINS

Jerry Hoyt Hunsucker, % Commercial Solvents Corporation, Terre Haute, Ind. 47803

No Drawing. Continuation-in-part of application Ser. No. 132,225, Apr. 7, 1971, which is a continuation-in-part of application Ser. No. 36,678, May 12, 1970, both now abandoned. This application Nov. 17, 1971, Ser. No. 199,795

Int. Cl. C08g *9/10*

U.S. Cl. 260—70 A 11 Claims

Resin compositions suitable for baked coatings consisting of the condensation product of a lower aliphatic aldehyde and urea, effected in the presence of dimethylolpropionic acid (DMPA). A method is provided for coating paper with the composition.

3,714,125
AROMATIC ORTHO-CARBAMATES ADDED TO POLYESTER POLYCONDENSATION

Takeo Shima, Takanori Urasaki, and Isao Oka, Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed Mar. 15, 1971, Ser. No. 124,507
Claims priority, application Japan, Mar. 19, 1970, 45/23,285

Int. Cl. C08g *17/015*

U.S. Cl. 260—75 M 12 Claims

During the formation of a fiber-forming polyester by the reaction of a dicarboxylic acid or its functional derivative with a glycol, an aromatic ortho-carbonate such as tetraphenyl carbonate is added at a certain stage of the polycondensation where the intrinsic viscosity [η] of the polyester is at least 0.2, whereby a fiber-forming polyester of a low content of free carboxyl groups is prepared. Moreover, the reaction rate of the polycondensation is greatly increased by selecting and using a suitable aromatic ortho-carbonate and therefore a fiber-forming polyester of a very high molecular weight can be obtained.

3,714,126
ANTIMONY COMPOUND CATAYZED ETHYLENE GLYCOL POLYESTERIFICATION WITH ADDED SECOND DIOL

James Angus Wilson Reid, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 761,289, Sept. 20, 1968, abandoned. This application Sept. 27, 1971, Ser. No. 184,270

Int. Cl. C08g *17/015*

U.S. Cl. 260—75 R 10 Claims

Addition of a diol selected from the group consisting of 1,2-propanediol, 1,3-propanediol, 1,3-butanediol, 2,3-butanediol, and 1,3-cyclohexanediol to the trivalent antimony compound (e.g. Sb_2O_3) catalyzed formation of ethylene glycol polyesters of aromatic acids (e.g., terephthalic) results in products of higher luminace value.

3,714,127
URETHANE ADHESIVE HAVING IMPROVED SAG RESISTANCE

Hubert J. Fabris, Akron, Edwin M. Maxey, Kent, and Heinz Uelzmann, Cuyahoga Falls, Ohio (all % The General Tire & Rubber Company, P.O. Box 951, Akron, Ohio 44309)

No Drawing. Filed Dec. 13, 1971, Ser. No. 207,655

Int. Cl. C08g *22/00*

U.S. Cl. 260—77.5 AM 4 Claims

The addition of small amounts of di- and multi-primary amines to a two-component polyurethane-based adhesive increases the viscosity of the adhesive mixture immediately after blending of the adhesive components such that run-off or dripping of the adhesive from inclined or overhead surfaces is substantially eliminated.

3,714,128
POLYUREA COATING BASED ON CYANOALKYLATED POLYOXYALKYLENE POLYAMINES

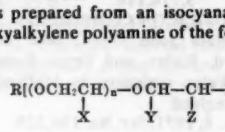
Richard Lee Rowton, and Ernest Leon Yeakey, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 852,488, Aug. 22, 1969, abandoned. This application June 25, 1971, Ser. No. 156,925

Int. Cl. C08g *22/02, 22/16*

U.S. Cl. 260—77.5 CH 9 Claims

Polyureas prepared from an isocyanate and a cyanoalkylated polyoxyalkylene polyamine of the formula



wherein A is a cyano-lower-alkyl radical or hydrogen provided at least one A is a cyano-lower-alkyl radical are useful as spray coatings. These sprayed polyurea coatings are useful protective coatings which can be used in any field where protective coatings are desirable.

3,714,129
POLYMERS WITH RECURRING IMIDAZOLE SEGMENTS

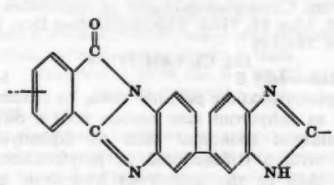
Billy M. Culbertson, Burnsville, Minn., assignor to Ashland Oil & Refining Company, Ashland, Ky.

No Drawing. Continuation of abandoned application Ser. No. 606,035, Dec. 30, 1966. This application Apr. 26, 1971, Ser. No. 137,652

Int. Cl. C08g *20/32*

U.S. Cl. 260—78 TF 1 Claim

A polymeric composition in which the recurring units along the polymer chain have the formula:



is characterized by a very high degree of thermal stability.

3,714,130
PROCESS FOR THE ANIONIC POLYMERIZATION OF CAPROLACTAM

William J. Farrissey, Jr., North Bradford; James S. Rose, Guilford, and Adnan A. R. Sayigh, North Haven, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 10, 1971, Ser. No. 179,549

Int. Cl. C08g *20/18*

U.S. Cl. 260—78 L 4 Claims

An improved process for the anionic polymerization of caprolactam is described. Trifluoroacetic anhydride is employed as promoter in amounts of 0.2 mole percent to 5.0 mole percent based on caprolactam. The use of trifluoroacetic anhydride permits lower reaction temperatures, higher yields of polyamide, and higher molecular weights of polymer.

3,714,131
POLYAMIDEIMIDES

John T. Hoback, and Fred F. Holub, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 11, 1971, Ser. No. 171,012
Int. Cl. C08g 20/32
U.S. Cl. 260—78 TF 5 Claims

New and useful polyamideimides and their precursor polyamic acids are provided. The polyamic acid is prepared by reacting aliphatic diacid, tricarboxylic acid anhydride and polyamine material and further reacting this reaction product with organic dianhydride, aliphatically unsaturated organic anhydride and polyamine including polymethylene polyaniline. The polyamic acid is cured to provide the final polyamideimide which is useful for coating, adhesive, laminating, molding and other fabrications.

3,714,132
UNITARY LIQUID POLYSULFIDE POLYMER COMPOSITION

Osamu Nakanishi, Ibaraki-shi, Osaka-fu, and Ikuo Tanaka, Kasatsu-shi, Shiga-ken, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 14, 1970, Ser. No. 98,203
Int. Cl. C08g 23/00
U.S. Cl. 260—79 7 Claims

A unitary polysulfide polymer composition protected from moisture and capable of being stored in a condition stable in a single container without undergoing curing and capable of being cured on contact with moisture in the atmosphere, said composition comprising (*a*) 100 parts by weight of a liquid polysulfide polymer, (*b*) a curing agent capable of being activated in the presence of an acid, and (*c*) 0.5 to 10 parts by weight of an organosilicon compound having at least one carbon atom and at least one RCOO— group, wherein R is hydrogen or a lower alkyl group, bonded to the silicon atom.

3,714,133
PROCESS FOR PREPARING ALTERNATING COPOLYMER OF BUTADIENE AND α-OLEFINE AND NOVEL ALTERNATING COPOLYMER OF BUTADIENE AND α-OLEFINE CONTAINING CIS-CONFIGURATION BUTADIENE UNIT

Akihiro Kawasaki, and Isao Maruyama, both of Ichihara-shi, Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed May 8, 1970, Ser. No. 35,637
Claims priority, application Japan, May 13, 1969, 44/36161; July 16, 1969, 44/55768; July 24, 1969, 44/58030; Aug. 7, 1969, 44/62009; Dec. 12, 1969, 44/99375; Dec. 12, 1969, 44/99376
Int. Cl. C08f 1/42, 15/04, 19/08
U.S. Cl. 260—84.1 8 Claims

A process for preparing alternating copolymer of butadiene and α-olefine which comprises contacting butadiene and the α-olefine in liquid phase with a catalyst system comprising the first component of AlR_3 wherein R represents a hydrocarbon radical selected from the group consisting of alkyl, aryl and cycloalkyl radical in which at least one R is selected from the group consisting of alkyl having at least 3 carbon atoms per one molecule, aryl and cycloalkyl radical and the second component of TiX'_4 wherein X′ is selected from the group consisting of chlorine, bromine and iodine, or a catalyst system comprising the first component of AlR_3 wherein R represents a hydrocarbon radical selected from the group consisting of alkyl, aryl and cycloalkyl radical, the second component of TiX'_4 wherein X′ is the same as that defined above and the third component of a carbonyl group-containing compound. An alternating copolymer of butadiene and α-olefine, the microstructure of butadiene unit of the alternating copolymer contains cis-configuration. The alternating copolymers and rubber-like in character and can be used as polymeric plasticizers, in adhesives and can be vulcanized with sulfur or a sulfur compound to produce vulcanized elastomers.

3,714,134
MOLECULAR SIZING PROCESS

Jerome Robert Olechowski, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Apr. 30, 1971, Ser. No. 139,255
Int. Cl. C08d 5/00, 13/00
U.S. Cl. 260—85.3 R 19 Claims

Low molecular weight butyl-type copolymers are prepared by contacting a butyl-type rubber with a catalyst composition comprising a transition metal salt, an organometallic compound of a metal of Group I–A, II–A, II–B, or III–A of the Periodic Table of Elements, and a proton donor. The catalyst composition preferably comprises a halide of tungsten, molybdenum, or rhenium, an alkyl aluminum halide, and a lower alkanol.

3,714,135
PRODUCTION OF HOMOPOLYMERS OR COPOLYMERS OF ETHYLENE

Helmut Pfannmueller; Friedrich Urban, both of 6700 Limburgerhof; Hans Gropper, and Volker Gierth, both of 6703 Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed Sept. 16, 1970, Ser. No. 72,866
Int. Cl. C08f 1/60, 15/02
U.S. Cl. 260—86.7 7 Claims

Production of homopolymers or copolymers of ethylene by homopolymerization of ethylene or copolymerization of mixtures of ethylene and other monomers at superatmospheric pressure and elevated temperature under the influence of a free radical generating polymerization initiator with or without a polymerization regulator. The initiator used is a mixture of (a) an initiator having a halflife of ten to 30 hours at 50°C and (b) an initiator having a halflife of 0.2 to 10 hours at 50°C, the halflife at 50°C of initiator (a) being at least twice as long as that of initiator (b). Polymers having a high molecular weight and a low degree of branching are obtained in a fairly high yield.

3,714,136
PROCESS FOR RECOVERING ACRYLAMIDE POLYMERS FROM GELS

David Benedict Gershberg, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 21, 1971, Ser. No. 191,333
Int. Cl. C08f 47/02, 29/00
U.S. Cl. 260—89.7 S 10 Claims

A method for the production of free-flowing, dry polymers of acrylamide having molecular weights of over about 6 million wherein fragments of said polymers are cut into particles of about 7–100 mesh and dried while suspended in a gas stream, is disclosed.

3,714,137
PROCESS FOR THE PRODUCTION OF POLYVINYLIDENE FLUORIDE IN THE PRESENCE OF A PEROXYDISULFATE INITIATOR AT AN ACIDIC PH

Klaus Lienhard, 8223 Trostberg, and Dieter Ulmschneider, 624 Konigstein, both of Germany, assignors to Suddeutsche Kalkstickstoff-Werke AG, Trostberg, Germany

Filed July 31, 1970, Ser. No. 60,114
Claims priority, application Germany, Aug. 5, 1969, P 19 39 852.8
Int. Cl. C08f 3/20
U.S. Cl. 260—92.1 5 Claims

Vinylidene fluoride is polymerized in an acidic aqueous medium in the presence of a peroxide disulfate polymerization

initiator in a concentration of less than 0.5 gram/liter of the liquid reaction phase.

3,714,138
LOW TEMPERATURE POLYMERIZATION OF CYCLIC POLYENES
Charles F. Cook, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Mar. 9, 1970, Ser. No. 17,889
Int. Cl. C08f *1/66, 7/02*
U.S. Cl. 260—93.1 8 Claims

Cyclic polyolefinic compounds are polymerized with a catalyst of tungsten oxide or sulfide or oxide of Group V–B metals or tellurium, on silica or thoria, at temperatures of less than 150° C. to form polyunsaturated hydrocarbons of higher molecular weight.

3,714,139
OPTIONALLY SUBSTITUTED ASPARTYL CYCLOHEXYLALANINE LOWER ALKYL ESTERS, COMPOSITIONS AND METHOD
James M. Schlatter, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.
No Drawing. Filed July 14, 1969, Ser. No. 841,582
Claims priority, application Great Britain, July 17, 1968, 33,971/68
Int. Cl. C07c *103/52*
U.S. Cl. 260—112.5 5 Claims

Potent sweetening agents comprising lower alkyl esters of dipeptides containing the N-terminal residue of aspartic acid and the residue of an optionally substituted cyclohexylalanine are prepared by hydrogenation of the corresponding dipeptides containing the N-terminal residue of aspartic acid and an optionally substituted phenylalanine.

3,714,140
PEPTIDE SYNTHESIS
Frank Sipos, East Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.
Filed March 16, 1971, Ser. No. 124,912
Int. Cl. C07c *103/52*; C09h
U.S. Cl. 260—112.5 9 Claims

An improved solid phase process for peptide synthesis wherein all steps of the synthesis are carried out in a solvent which produces a highly swollen state in the resin and wherein the coupling agent employed is one which forms by-products which are soluble in the solvent.

3,714,141
PROCESS FOR MAKING 7-HALOLINCOMYCINS
Kenneth P. Shephard, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Filed May 26, 1970, Ser. No. 40,724
Int. Cl. C08b *19/00*
U.S. Cl. 260—210 R 6 Claims

7-Halo-7-deoxylincomycin and analogs thereof are prepared by reacting a lincomycin with thionyl chloride to form a lincomycin 3,4-O-cyclic sulfite, then with Rydon reagent to form a 7-halo-7-deoxylincomycin 3,4-O-cyclic sulfite, and removing the 3,4-O-cyclic sulfite group by hydrolysis.

3,714,142
ERYTHROMYCINE
Jerry Roy Martin, Waukegan, and Alma W. Goldstein, Lake Bluff, both of Ill., assignors to Abbott Laboratories, Chicago, Ill.
Filed Jan. 18, 1971, Ser. No. 107,428
Int. Cl. C07g *11/00*
U.S. Cl. 260—210 E 2 Claims

Erythromycin E is useful as an antibiotic. The compounds is prepared by the fermentation of erythromycin with *Streptomyces erythreus* NRRL 3887 in suitable nutrient media.

3,714,143
CONTINUOUS PROCESS FOR MANUFACTURE OF NITROCELLULOSE
Charles W. Lewis, Morristown, and Everette O. Hann, Dover, both of N.J., assignors to The United States of America as represented by the Secretary of the Army
Filed April 13, 1971, Ser. No. 133,648
Int. Cl. C08b *5/02*
U.S. Cl. 260—220 7 Claims

Continuous, pollution-free process for manufacture of nitrocellulose involves passing cellulose and nitric acid-magnesium nitrate nitrating agent through an attrition mill, separating the spent nitrating agent from the nitrocellulose, purifying the latter by countercurrent water wash, treating the wash liquors with an ion-exchange system to recover the magnesium and nitrate values therefrom, and recycling the latter and spent nitrating agent to the system. The invention provides an efficient, closed system which generates no waste products to pollute the environment.

3,714,144
PROCESS FOR THE PRODUCTION OF SUCROSE ESTERS OF FATTY ACIDS
Reuben O. Feuge, New Orleans, Hampden J. Zeringue, Jr., Destrehan, and Theodore J. Weiss, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed May 29, 1969, Ser. No. 829,131
Int. Cl. C07c *69/32*
U.S. Cl. 260—234 R 10 Claims

This invention relates to a process for preparing esters of sucrose and fatty acids which acids contain from 2 to 22 carbon atoms. More particularly, this invention relates to a process for interesterifying sucrose and esters of the said fatty acids in the presence of certain alkali metal soaps which soaps function as catalysts. The mixed reactants without solvent are heated quickly above the melting point of sucrose and then the reaction is conducted at this temperature or a slightly lower temperature.

3,714,145
1,4-BENZODIAZEPINE-2-ONES AND INTERMEDIATES
Stanley C. Bell, Philadelphia, and Scott J. Childress, Newtown Square, both of Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Filed Feb. 6, 1961, Ser. No. 87,102
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 D 11 Claims

This invention relates to certain 1,4-benzodiazepine-2-ones and intermediates for their preparation. The 1,4-benzodiazepine-2-ones are useful as sedatives, anticonvulsants, analgesics and tranquilizers.

3,714,146
NOVEL SYNTHESES OF CEPHALEXIN AND INTERMEDIATES THEREFOR
William J. Gottstein, and Lee C. Cheney, both of Fayetteville, N.Y., assignors to Bristol-Meyers Company, New York, N.Y.
Continuation-in-part of Ser. No. 27,441, April 10, 1970. This application Oct. 5, 1970, Ser. No. 78,165
Int. Cl. C07d *99/16, 99/24*
U.S. Cl. 260—239.1 8 Claims

The antibacterial agent cephalexin is prepared from readily available hetacillin by the consecutive steps of nitrosation or formylation to give N-nitroso- or N-formyl-hetacillin, oxidation as with $NaIO_4$ below pH 5 to give the corresponding sulfoxide, rearrangement by heat, preferably with acid present, to give N-nitroso- or N-formylhetacephalexin and finally cleavage to give cephalexin as by zinc and acetic acid or Raney nickel and hydrogen or, preferably, hydrogen chloride in dioxane.

3,714,147

(2-OXO-AZETIDINO)BENZOPHENONE COMPOUNDS

Peter H. L. Wei, Springfield, Pa., and Stanley C. Bell, Penn Valley, Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 735,534, June 10, 1968, Pat. No. 3,644,401. This application June 10, 1971, Ser. No. 151,960
Int. Cl. C07d 25/02
U.S. Cl. 260—239 A 2 Claims

The invention is directed to N-aryl-2-benzoyl-α-oxocyclopolymethylene amines which have anticonvulsant properties particularly in preventing convulsions such as are produced by metrazol or electric shock.

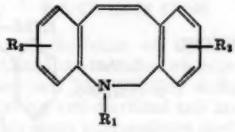
3,714,148

PROCESS FOR PREPARING DIBENZAZOCINE DERIVATIVES AND SALTS THEREOF

Tadashi Okamoto, Ashiya-shi, Tsuyoshi Kobayashi, Minoo-shi, and Hisao Yamamoto, Nishinomiya-shi, Japan, assignors to Sumitomo Chemical Co., Ltd.

No Drawing. Filed Oct. 10, 1969, Ser. No. 865,482
Claims priority, application Japan, Oct. 15, 1968, 43/75,446, 43/75,448; 43/75,449; Oct. 18, 1968, 43/76,380
Int. Cl. C07d 41/00, 57/00
U.S. Cl. 260—239 D 3 Claims

5,6 - dihydrodibenz[b,f]azocine derivatives of the formula

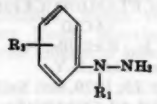


wherein R_1 is a hydrogen atom, a halo (lower) alkyl group or a group of the formula

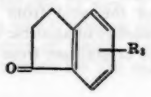
wherein A is a lower alkylene group, R_4 is a hydrogen atom or a lower alkyl group and R_5 is a lower alkyl group or a group of the formula

wherein R_4 and R_5 are as defined above and the ring structure

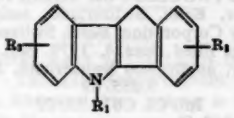
represents a 5 to 7-membered nitrogen-containing heterocyclic group, and R_2 and R_3 are each a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group are prepared. A phenylthydrazine derivative of the formula



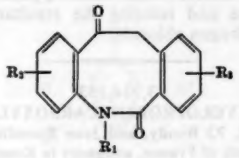
wherein R_1 and R_2 are each as defined above is reacted product having the formula



wherein R_3 is as defined above. The resulting reaction product having the formula



wherein R_1, R_2 and R_3 are each as defined above is treated with an oxidizing agent to form a resultant product of the formula



wherein R_1, R_2 and R_3 are each as defined above. This resultant product is treated with a metal hydride complex. The product in each step is, if necessary, subjected to haloalkylation, amination and/or aminoalkylation after the step.

3,714,149

PYRIDOBENZODIAZEPINONES

Jackson B. Hester, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 3, 1969, Ser. No. 873,719
Int. Cl. C07d 53/06
U.S. Cl. 260—239.3 T 2 Claims

1,2-Dihydro-8-phenyl-3H-pyrido[3,2,1-jk][1,4]benzodiazepin-5(6H)-ones, processes for preparing the same and intermediates prepared by said processes. The novel compounds of this invention exhibit tranquilizing and anticonvulsant activity in animals.

3,714,150

6-(2,5-DIOXO-4-PHENYL-N-SUBSTITUTED-4-IMIDAZOLINECARBOXAMIDO)PENICILLANIC ACIDS

John H. Sellstedt, King of Prussia, and Stanley C. Bell, Penn Valley, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,980
Int. Cl. C07d 99/16
U.S. Cl. 260—239.1 4 Claims

Novel 6-(2,5-dioxo-4-phenyl-N-substituted-4-imidazolidinecarboxamido)penicillanic acids and intermediates are described which are useful as antibacterial agents.

3,714,151

MONO- AND DIPHTHALIMIDO DERIVATIVES AND THEIR USE IN DETERGENT AND BLEACH COMPOSITIONS

Warren I. Lyness, Mount Healthy, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Nov. 2, 1967, Ser. No. 680,005
Int. Cl. C07d 27/52
U.S. Cl. 260—240 CA 4 Claims

The provision of mono- and diphthalimido derivatives of fluorescent, aromatic amines and their use in (1) laundry detergent compositions which contain an organic detergent and an alkaline builder salt and (2) in aqueous and granular hypochlorite bleach compositions.

3,714,152

ARYLVINYL-v-TRIAZOLES, THEIR USE FOR THE OPTICAL BRIGHTENING OF ORGANIC MATERIALS AND PROCESS FOR THEIR PRODUCTION

Hans Schlapfer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Basel, Switzerland

No Drawing. Filed June 4, 1970, Ser. No. 43,567
Claims priority, application Switzerland, June 13, 1969, 9,055/69
Int. Cl. C07d 55/02
U.S. Cl. 260—240 D 1 Claim

New 2-[3-phenylcoumarinyl-(7)]-4-styryl-5-chloro-v-triaboles are brighteners of high-molecular organic materials. The compounds are obtained by oxidative ring closure of isonitrosobenzalacetone-[-phenyl-coumarinyl-(7)]-hydrazone and reacting the resultant v-triazole-1-oxide with hydrogen chloride.

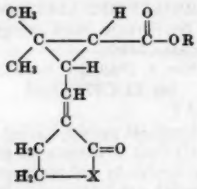
3,714,153

NOVEL CYCLOPROPANECARBOXYLIC ACIDS

Jacques Martel, 93 Bondy, and Jean Buendia, 94 Fontenay-Sous-Bois, both of France, assignors to Roussel-Uclaf, Paris, France

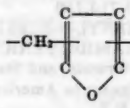
Filed June 22, 1970, Ser. No. 48,488
Int. Cl. C09b 23/00
U.S. Cl. 260—240 R 18 Claims

Novel 3,3-dimethyl-2-(2′-oxo-3′-x-cyclopentylidenemethyl)-1-cyclopropanecarboxylic acids of a cis or trans structure, in the form of racemic mixtures or optically active isomers of the formula

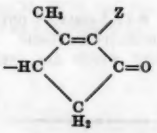


I

wherein X is selected from the group consisting of oxygen, sulfur and imino and R is selected from the group consisting of hydrogen, lower alkyl of one to six carbons, a radical of the formula



wherein Y_3 is aryl such as phenyl, and a radical of the formula



wherein Z is alkenyl or alkadienyl such as allyl, butenyl and pentadienyl and their preparation and intermediates therefor.

3,714,154

RECOVERY OF CEPHALOTHIN SALTS

Ralph R. Pfeiffer, and Kuo Shang Yang, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 24, 1970, Ser. No. 101,383
Int. Cl. C07d 99/24
U.S. Cl. 260—243 C 11 Claims

This invention is addressed to an improved method for the recovery of alkali metal salts of caphalothin from aqueous solution in which a non-toxic alkali metal salt is added in the aqueous solution to precipitate the cephalothin salts substantially free of impurities.

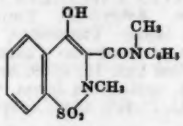
3,714,155

4-HYDROXY-2,N-DIMETHYL-2H-1,2-BENZOTHIAZINE-3-CARBOXANILIDE1,1-DIOXIDE AND PROCESS THEREFOR

Harold Zinnes, White Meadow Lake, Rockaway; Neil A. Lindo, Chatham, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

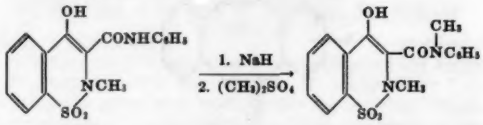
Filed Sept. 27, 1971, Ser. No. 184,193
Int. Cl. C07d 93/02
U.S. Cl. 260—243 R 3 Claims

A compound of the formula is disclosed:



II

This compound is prepared as follows:



I II

It is useful as an anti-inflammatory agent.

3,714,156

LACTAM PROCESS

Henry Rapoport, Philadelphia, Pa., assignor to The Regents of the University of California, Berkeley, Calif.

Filed June 22, 1970, Ser. No. 48,550
Int. Cl. C07d 39/00
U.S. Cl. 260—243 C 15 Claims

A process for preparing lactams, particularly 1-azabicyclo[4.2.0]octanes, 1-azabicyclo[3.2.0]heptanes, 4-thia-1-azabicyclo[3.2.0][4.2.0]octenes, which comprises subjecting a cyclic α-ketoamide to an oxidizing agent to form a carboxyl substituted lactam structure. The oxidant is preferably periodate, in an aqueous solution, at pH 5–9 and room temperature. The novel products obtained from the process are useful intermediates in the preparation of antimicrobial agents. The cyclic α-ketoamide starting materials are also novel.

3,714,157

PROCESS FOR THE DECOLORIZATION OF 7-[α-(4-PYRIDYLTHIO)ACETAMIDO]CEPHALOSPORANIC ACID

Elwin J. Richardson, Jr., Kirkville, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Oct. 23, 1970, Ser. No. 83,599
Int. Cl. C07d 99/24
U.S. Cl. 260—243 C 11 Claims

The purification and decolorization of 7-[α-(4-pyridylthio)-acetamido]cephalosporanic acid has been accomplished by the recrystallization of the acid from dimethylformamide (DMF) containing a quantity of ascorbic acid. The essentially pure, colorless product crystallizes from solution as a DMF solvate.

3,714,158

5-NITRO-2-AMINOMETHYL IMIDAZOLES

Dale R. Hoff, Basking Ridge, N.J., and David W. Henry, Menlo Park, Calif., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 848,404, July 29, 1969, which is a continuation of application Ser. No. 717,464, Mar. 29, 1968, which is a continuation-in-part of application Ser. No. 565,333, June 17, 1966, all now abandoned, which in turn is a division of application Ser. No. 355,428, Mar. 27, 1964, now Patent No. 3,299,090. This application Jan. 19, 1971, Ser. No. 107,821

Int. Cl. C07d *87/40*

U.S. Cl. 260—247.5 R 5 Claims

1-substituted-2-aminoalkyl-5-nitroimidazole compounds prepared from 1-substituted-2-hydroxymethyl-5-nitroimidazoles, useful as antiprotozoal agents, especially against the diseases trichomoniasis and histomoniasis.

3,714,159

2,2-DIARYL-4-(4'-ARYL-4'-HYDROXY-PIPERIDINO)-BUTYRAMIDES

Paul Adriaan Jan Janssen, Vosselaar, Carlos Jan Ernest Josef Niemegeers, Deurne, and Raymond Antoine Stokbroekx and Jan Vandenberk, Beerse, Belgium, assignors to Janssen Pharmaceutica, N.V.

No Drawing. Continuation-in-part of abandoned application Ser. No. 42,530, June 1, 1970. This application Mar. 30, 1971, Ser. No. 129,607

Int. Cl. C07d *87/46*

U.S. Cl. 260—247.1 18 Claims

Compounds of the class of 2,2-diaryl-4-(4'-aryl-4'-hydroxy-piperidino)butyramides wherein said aryl and said amide functions are variously defined groups, said butyramides having anti-diarrheal and analgesic actvities; also included are novel intermediates used in the synthesis of said butyramides.

3,714,160

PHENOXAPHOSPHINIC ACID DERIVATIVES

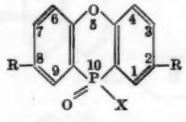
Stanley J. Strycker, 801 Willys St., Midland, Mich.

Division of Ser. No. 764,913, Oct. 3, 1968, Pat. No. 3,576,863. This application May 25, 1970, Ser. No. 48,693

Int. Cl. C07d *87/32*

U.S. Cl. 260—247.7 C 2 Claims

Phenoxaphosphinic acid derivatives corresponding to the formula



wherein R represents chloro, bromo, lower alkyl or lower alkoxy and X represents morpholino. The compounds are useful as pesticides for the control of plant pests.

3,714,161

MORPHOLINE DERIVATIVES

Keith Blakeney Mallion, Ralph William Turner, and Alexander Henry Todd, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Nov. 24, 1967, Ser. No. 685,302

Claims priority, application Great Britain, Dec. 28, 1966, 57,963/66

Int. Cl. C07d *87/32*

U.S. Cl. 260—247.7 C 2 Claims

The disclosure relates to new 2 - aryloxymethylmorpholine derivatives which possess central nervous depressant action, and some of which also possess thymoleptic activity, and to processes for the manufacture of the said morpholine derivatives and to pharmaceutical compositions containing them. Typical of the morpholine derivatives disclosed is 2-(o-ethoxyphenoxymethyl)-morpholine.

3,714,162

NEW HERBICIDAL N-(1-CYCLOALKEN-1-YL)-AMINO-S-TRIAZINE COMPOUNDS

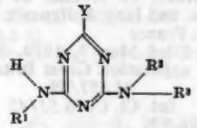
John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed March 24, 1971, Ser. No. 127,625

Int. Cl. C07d *55/20*

U.S. Cl. 260—249.8 16 Claims

Compounds of the formula



where Y represents chloro, alkoxy or alkythio of a maximum of four carbon atoms;

R^1 represents alkyl, or alkoxyalkyl containing from one to eight carbon atoms;

R^2 represents alkyl containing from one to eight carbon atoms with the provision that the sum of the carbon atoms in R^1 and R^2 is from 4 to 10 and R^3 is a 1-cyclopenten-1-yl, a 1-cyclohexen-1-yl, a 1-cycloheptен-1-yl, or a lower alkyl or lower alkoxy substituted 1-cyclopenten-1-yl, 1-cyclohexen-1-yl, or 1-cycloheptен-1-yl group.

These compounds are useful as herbicides.

3,714,163

β-(THEOPHYLLINE ETHYL) MONOSULFITE

Francois Clemence, Rosny-sous-Bois, and Odile Le Martret, Paris, both of France, assignors to Roussel Uclaf, Paris, France

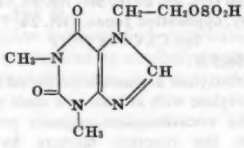
Continuation-in-part of Ser. No. 730,628, May 20, 1968, abandoned. This application Aug. 20, 1970, Ser. No. 65,659

Claims priority, application France, May 23, 1967, 107454; July 28, 1967, 116130

Int. Cl. C07d *57/48*, *57/52*

U.S. Cl. 260—253 3 Claims

As a new compound β-(theophylline ethyl) monosulfite having the formula



I

and salts thereof with inorganic and organic bases, their process of preparation and as an antibacterial agent, the tetracycline salt of β-(theophylline ethyl) monosulfite.

3,714,164

PROCESS FOR THE MANUFACTURE OF TETRACHLOROPYRIMIDINE

Guido Steffan, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed July 1, 1970, Ser. No. 51,728

Claims priority, application Germany, July 3, 1969, P 19 33 784.9

Int. Cl. C07d *51/36*

U.S. Cl. 260—251 R 4 Claims

Process for the manufacture of tetrachloropyrimidine by the action of chlorinating agents on barbituric acid,

characterised in that barbituric acid is reacted in phosphorus oxychloride, in the absence of water, with approximately 2.9 to 3.5 mols of phosphorus trichloride per mol of barbituric acid and approximately 4.0 to 5.0 mols of chlorine, with warming, preferably in the presence of a catalyst, to give tetrachloropyrimidine. Suitable catalysts are tertiary amines and acid amides. The new process gives considerably higher yields than the known processes. Tetrachloropyrimidine is an intermediate for the production of reactive dyestuffs.

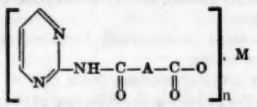
3,714,165

AMINO-PYRIMIDINE DERIVATIVES AND THEIR PREPARATION

Albert H. Beaufour, 56 Avenue de Suffren, 75 Paris 15eme, France, and Jean A. Renault, 17 Rue de Sevres, 75 Paris 6eme, France

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,930
Claims priority, application Great Britain, Apr. 3, 1969, 17,557/69
Int. Cl. C07d *51/42*
U.S. Cl. 260—256.4 N **17 Claims**

Amino-pyrimidine derivatives of the formula



are disclosed, which compounds possess an anti-depressant or psychostimulant activity and wherein

A represents

(1) an alkylene chain having up to 16 carbon atoms, or

(2) a lower alkylene chain substituted by:
amino, or
a lower alkanoyl amino having from 2 to 5 carbon atoms.

M represents H, Na, Ca or an organic basic ammonium salt.

n is an integer equal to the valence of M.

3,714,166

COCARBOXYLASE ARGINATE AND PROCESS FOR THE PRODUCTION THEREOF

Seigo Kondo, Horinouchi, Suginami-ku, Tokyo; Toshikazu Tabata, Kohoku-ku, Yokohama-shi, Kanagawa-ken, and Jiro Horiuchi, Sayama-shi, Saitama-ken, all of Japan, assignors to Kanto Ishiseiyaku Co., Ltd., Saitama-ken, Japan

Filed Oct. 26, 1970, Ser. No. 84,180
Claims priority, application Japan, Oct. 24, 1969, 44/85114
Int. Cl. C07d *99/12*
U.S. Cl. 260—256.5 B **1 Claim**

A stable cocarboxylase arginate is prepared by reacting one mole of cocarboxylase with at least one mole of arginine or a salt thereof. The cocarboxylase arginate product may be recovered from the reaction mixture by conventional techniques, and has excellent moisture stability and an enhanced pharmaceutical activity.

3,714,167

4-AMINOALKYLAMINO-2-HALOBENZYL ALCOHOLS AND ALKYL ETHERS THEREOF

Sydney Archer, Bethlehem, and David Rosi, East Greenbush, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 664,628, Aug. 31, 1967, now Patent No. 3,558,629, dated Jan. 26, 1971, which is a continuation-in-part of application Ser. No. 444,848, Apr. 1, 1965, now Patent No. 3,379,620, dated Apr. 23, 1968. This application June 2, 1970, Ser. No. 42,876
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 C **11 Claims**

4-[amino-(polycarbon-lower-alkyl)-amino] - 2 - halobenzyl alcohols and lower-alkyl ethers thereof have schistosomacidal activity. The benzyl alcohols are prepared: by reduction of the corresponding benzaldehydes or lower-alkyl benzoates; by microbiological oxidation of the corresponding 4-substituted-amino-2-halotoluenes; or, for the compounds where polycarbon-lower-alkyl is ethylene, by reducing the corresponding lower-alkyl 4-(aminoacetylamino)-2-halobenzoates or by reducing the corresponding 4 - (aminoacetylamino)-2-halobenzyl alcohols. The ethers are prepared by heating the benzyl alcohols with a lower-alkanol in the presence of an acid.

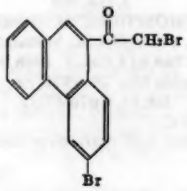
3,714,168

PREPARING α-BROMOMETHYL KETONES VIA SUBSTITUTED DIETHYL MALONATES

Robert E. Olsen, Shingle Springs, Calif., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,506
Int. Cl. C07d *33/36*
U.S. Cl. 260—281 R **5 Claims**

The present invention discloses a process for the preparation of monobromo methyl ketones in high yield and good purity. The invention also discloses a composition synthesized from the process for use as an intermediate in the preparation of an antimalarial drug of known effectiveness. The antimalarail intermediate is 6-bromo-phenanthrene-9α-bromomethyl ketone having the formula:



3,714,169

PHOSPHATE ESTERS OF HOMOPHTHALIMIDES

Stanley T. D. Gough, Edison, N.J., assignor to Mobil Oil Corporation

Filed March 4, 1970, Ser. No. 16,588
Int. Cl. C07d *35/30*
U.S. Cl. 260—283 P **3 Claims**

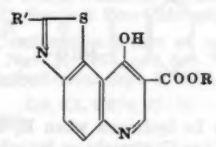
Phosphate ester derivatives of N-substituted homophthalimides form a new class of insecticides. They are highly effective against the Mexican Bean Beetle, Southern Armyworm and Spider Mite in standard insecticide dip test methods. They are highly effective against the Housefly and Bean Aphid in standard insecticide spray test methods. They are also highly effective against the Southern Corn Rootworm in the standard insecticide soil mix test method.

3,714,170
2-SUBSTITUTED OR NON-SUBSTITUTED-NON-THIAZALO [5,4-F] QUINALINE-8-CARBOXYLATES COMPOUNDS AND THEIR METHOD OF PREPARATION

Renzo Dohmori; Shizuo Kadoya; Isao Takamura; Yasuo Oshima, and Takeo Naito, all of Tokyo-to, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo-to, Japan

Filed Nov. 17, 1970, Ser. No. 90,479
Claims priority, application Japan, Nov. 17, 1969, 44/91946
Int. Cl. C07d *91/42*
U.S. Cl. 260—283 S 9 Claims

A compound represented by the formula:



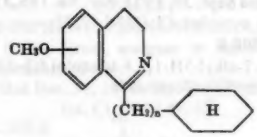
wherein R is a lower alkyl group, and R′ is a member selected from the group consisting of a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkylthio group and a sulfhydryl group.

3,714,171
1-(2-CYCLOHEXYLETHYL) -6 OR 7 METHOXY-1,2,3,4-TETRAHYDROISOQUINOLINE AND ACID ADDITION SALTS THEREOF

Eisaku Yamato, Yono; Yuji Miura, Kawaguchi; Masao Wada, Warabi; Toshio Sekiguchi, Kawasaki; Masazumi Kawanishi, Tokyo; Masanori Sato, Toda; Masao Hoshiyama, Tokyo and Taku Nagao, Warabi, all of Japan, assignors to Tanabe Seiyaku, Co., Ltd., Higashi-ku, Osaka, Japan

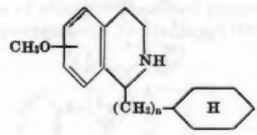
Division of Ser. No. 3,506, Jan. 16, 1970, abandoned. This application Dec. 13, 1971, Ser. No. 207,598
Claims priority, application Japan, Jan. 25, 1969, 44/5490; Jan. 25, 1969, 44/5491
Int. Cl. C07o *35/10*
U.S. Cl. 260—286 R 3 Claims

A 6- or a 7-methoxyisoquinoline compound having the formula



(I)

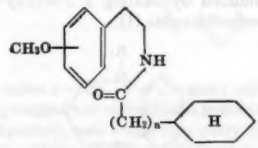
or



(II)

wherein *n* is 1-3 and its pharmaceutically acceptable acid addition salts are cutaneous vasodilators.

Compound (I) is produced by dehydrating an amide compound having the formula



(III)

wherein *n* is as defined above.

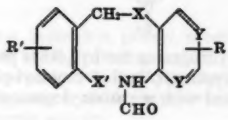
Compound (II) is produced by hydrogenating compound (I).

3,714,172
PROCESS FOR PREPARING 2-ACETAMIDO-3-BENZYLOXY OR 3-BENZYLTHIO-PYRIDIDES AND DERIVATIVES THEREOF

Harry Louis Yale, New Brunswick, and Jelka Pluscec, East Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Original application June 25, 1969, Ser. No. 836,654, now Patent No. 3,644,378, dated Feb. 22, 1972. Divided and this application June 18, 1971, Ser. No. 154,666
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 G 3 Claims

An improved process for preparing compounds of the formula



wherein X is oxy or thio; one Y is aza; the remaining Y is

R and R′ are the same or different and represent hydrogen, halogen, lower alkyl, lower alkoxy, trifluromethyl, trifluoromethylmercapto, trifluoromethoxy or N,N - dimethylaminosulfonyl; and X′ is chloro or bromo, is disclosed. These compounds are useful in the preparation of dihydropyridobenzoxazepines and dihydropyridobenzothiazepines.

3,714,173
PYRIDYL KETIPATE LACTONES AND DERIVATIVES

Blaine M. Sutton, Hatboro, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed July 6, 1971, Ser. No. 160,190
Int. Cl. C07d *31/36*
U.S. Cl. 260—295 R 7 Claims

Pyridyl ketipate lactones and derivatives having antiarthritic activity prepared by alcoholysis of an appropriate pyridyl substituted dilactone.

3,714,174
MANUFACTURE OF BIPYRIDYLIUM SALTS

John Edward Colchester, and John Gerard Carey, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 5, 1969, Ser. No. 882,699
Claims priority, application Great Britain, Dec. 20, 1968, 60,713/68
Int. Cl. C07d *31/44*
U.S. Cl. 260—295 AM 10 Claims

A process for the manufacture of a 1,1′-disubstituted-4,4′-bipyridylium salt which comprises treating the corresponding 1,1′-disubstituted-1,1′,4,4′-tetrahydro-4,4′-bipyridyl with an organic compound which has a redox potential in water more positive than −1.48 volts as compared with the saturated calomel electrode and which reacts with a hydride ion with the formation of an anion which under the conditions of the reaction has a redox potential more positive than −0.45 volt as compared with the saturated calomel electrode.

3,714,175

CERTAIN-1-ARYL-3-SUBSTITUTED BENZAMIDO-2-PYRROLIDINONES

Suzu Shigezane, Urawa, Fusaji Naoi, Tokyo, Seiichi Saito, Urawa, Michio Kojima, Nara, and Ryuichi Ishida, Osaka,, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

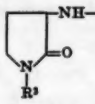
No Drawing. Filed July 28, 1971, Ser. No. 172,345

Claims priority, application Japan, Aug. 14, 1970, 45/71,533

Int. Cl. C07d *31/44, 27/08*

U.S. Cl. 260—295 AM 8 Claims

A pyrrolidinone compound of the formula:



wherein R^1 is hydrogen or methyl, R^2 is phenyl, halogenophenyl, methoxyphenyl, trifluoromethyl-phenyl or nitrophenyl, is reacted with a carboxyl compound of the formula:

$$R^3—COOH$$

3,714,176

PESTICIDAL PHOSPHOROUS-CONTAINING IMINO OXAZOLIDINES

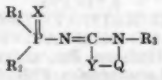
Edmund J. Gaughan, Kensington, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation-in-part of Ser. No. 705,017, Feb. 13, 1968, abandoned, which is a continuation-in-part of Ser. No. 673,993, Oct. 9, 1967, abandoned. This application March 23, 1970, Ser. No. 22,039

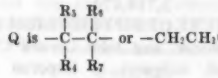
Int. Cl. C07d *85/26*

U.S. Cl. 260—307 F 28 Claims

Compounds corresponding to the formula



wherein X and Y are independently oxygen or sulfur, R_1 is lower alkyl, lower alkoxy, lower alkylthio, R_2 is lower alkyl, lower alkoxy, lower alkylthio, chloro lower alkyl, carbethoxy methylthio, allylthio, chloro-phenylthio, nitrobenzyloxy, phenyl or substituted phenoxy in which said substituents are nitro, cyano, methylthio, chloro or tert.-butyl; R_3 is lower alkyl, benzyl, phenyl, lower alkoxyalkyl, alkenyl, chloroalkenyl or 2-propynyl;



in which R_4 is hydrogen, lower alkyl, cyclohexyl or vinyl, R_5, R_6 and R_7 are independently hydrogen or lower alkyl; provided that when Q is $—CH_2CH_2CH_2—$ then R_3 is other than benzyl. The above-mentioned compounds are biologically effective as pesticides, especially against insects and acarids, and as herbicides. Representative compounds are: 2-[N-(O,O-dimethylphosphonothiono)-imino]-3-ethyl-5-methyl-1,3-oxazolidine, 2-[N-(0,0-diethylphosphonothiono)-imino]-3-ethyl-5-methyl-1,3-oxazolidine, 2-[N-(0,S-dimethylphosphonothiolo)-imino]-3-ethyl-5-methyl-1,3-oxazolidine, 2-(diethylthiophosphinoimino)-3-methyl oxazolidine, 2-(0,0-dimethylthiophosphorylimino)-3-methyl thiazolidine and 2-(O,O-dimethylthiophos-phoryl-imino)-3-allyl-perhydro-1,3-oxazine.

3,714,177

UREA DERIVATIVES OF 2-AMINOBENZOTHIAZOLES

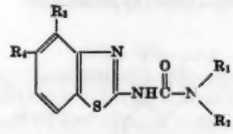
John E. Engelhart, Westfield, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed Apr. 9, 1970, Ser. No. 27,101

Int. Cl. C07d *91/46*

U.S. Cl. 260—305 17 Claims

Compounds having the following structure:



wherein R_4 may be hydrogen when R_3 is selected from the following: C_1 to C_8 straight or branched alkyl, C_3–C_6 alkenyl, C_3–C_6 alkynyl, C_3–C_8 cycloalkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_8 mono- or C_2–C_8 dialkylamino, C_1–C_4 alkylsulfoxy, C_1–C_4 alkylsulfone. These groups may be optionally substituted by halogen, C_1–C_4 alkoxy, C_1–C_4 alkylthio, cyano or nitro. In addition, R_3 may also be selected from the following: fluoro, chloro, bromo, hydroxy, cyano, amino, mercapto, or perhaloalkyl. When R_4 is not hydrogen, it may be the same or different than R_3 and may be one of the groups enumerated above for R_3. For the purpose of this invention R_1 and R_2 are selected from the following groups, C_1–C_8 straight or branched alkyl, C_3–C_8 alkenyl, C_3–C_6 alkynyl, C_1–C_6 alkoxy or C_3–C_8 cycloalkyl. These groups may be optionally substituted by halogen, C_1–C_4 alkoxy, C_1–C_4 alkylthio, cyano, or nitro. In addition, R_1 and R_2 may comprise together a ring from 3 to 8 atoms.

3,714,178

6,7-DIHYDRO-7-ALKYL-5H-1,2,4-TRIAZOLO[4,3-D][1,4] BENZODIAZEPINES AND THEIR PRODUCTION

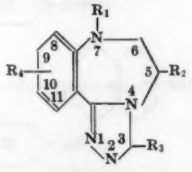
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 30, 1971, Ser. No. 185,379

Int. Cl. C07d *57/02*

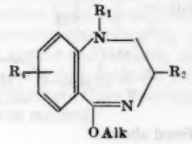
U.S. Cl. 260—308 R 5 Claims

6,7-Dihydro-7-alkyl-5H-1,2,4-triazolo[4,3-d][1,4] benzodiazepines of the formula II:



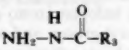
II

wherein R_1 is alkyl of one to three carbon atoms, inclusive; wherein R_2 and R_3 are selected from the group consisting of hydrogen and alkyl, defined as above; and wherein R_4 is selected from the group consisting of hydrogen, alkyl as defined above, nitro, cyano, fluoro, chloro, bromo, iodo, trifluoromethyl, and alkylthio in which alkyl is defined as above, are produced by heating a 5-alkoxy-2,3-dihydro-1-alkyl-1H-1,4-benzodiazepine (I)



I

wherein R_1, R_2, and R_4 are defined as above, and Alk is alkyl defined as above, with an alkanoyl hydrazide III



III

in which R_3 is defined as above, usually in an organic solvent.

3,714,179

1-ALKYL-2-FURFURYLTHIOIMIDAZOLES AND CONGENERS

Robert C. Tweit, Wilmette, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Continuation-in-part of applications Ser.. No. 773,634, Nov. 5, 1968, and Ser. No. 55,621, July 16, 1970. This application Sept. 8, 1970, Ser. No. 70,569

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **12 Claims**

Certain 1-alkyl - 2 - furfurylthioimidazoles and congeners—for example 2-furfuryl-1-methylimidazole hydrochloride and 2-(o-butylthiobenzylthio)-1-methyl imidazole hydrochloride—useful by reason of their valuable biological properties—including antiprotozoal, anti-bacterial, anti-fungal, anti-algal, anti-germinant, and anti-inflammatory activities—are disclosed.

3,714,180

SULFONYL BENZIMIDAZOLES

Rudiger D. Haugwitz, Highland Park, and Venkatachala Lakshmi Narayanan, Hightstown, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Aug. 12, 1970, Ser. No. 63,274

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **2 Claims**

Sulfonyl benzimidazoles are provided which are useful as anthelmintics.

3,714,181

2-ARYL-5,10-DIPHENYLPHENANTHRO(9,10-D)AZOLES

Ivan Lantos, Haifa, Israel, assignor to American Cyanamid Company, Stamford, Conn.

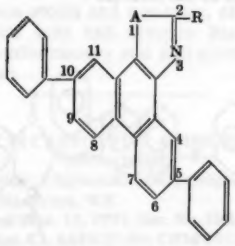
Filed Dec. 31, 1970, Ser. No. 103,285

Int. Cl. C07d *49/40*

U.S. Cl. 260—309.6 **5 Claims**

A new class of phosphorescent and photochromic 2-aryl-5,10-diphenylphenanthro[9,10-d]azoles of the formula

(I)



I

wherein A is imino (—NH—) or oxygen (—O—), R is a carbocyclic aryl group of not more than 3 benzene rings (phenyl, biphenylyl, naphthyl), and which may carry inert substituents such as alkyl, alkoxy, halogen, nitro, etc; are useful in phosphorescent and photochromic compositions.

3,714,182

IMINO-BENZYL-PYRAZOLES

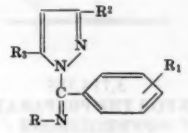
Victor Bandurco, Huntington Station, and James R. Shroff, Bronx, both of N.Y., assignors to U. S. V. Pharmaceutical Corporation

Filed Aug. 19, 1970, Ser. No. 65,304

Int. Cl. C07d *49/36*

U.S. Cl. 260—310 R **8 Claims**

Compounds of the formula



wherein R is alkyl, cycloalkyl, phenyl, substituted phenyl or phenylalkyl, R_1 is hydrogen, halogen, alkyl, trifluoromethyl, alkoxy, hydroxy or amino, R_2 is alkyl, phenylalkyl or carbalkoxy, and R_3 is hydrogen, alkyl, phenyl or substituted phenyl possess hypoglycemic activity.

3,714,183

BISPYRROLIDON E-FORMALDEHYDE ADDITION PRODUCTS AND THEIR USE AS CROSSLINKING AGENTS WITH CELLULOSE

Sidney L. Vail, New Orleans, La., assignor to The United States of America as represented by the Secretary of the Agriculture

Division of Ser. No. 854,292, Aug. 29, 1969, Pat. No. 3,567,361. This application Feb. 17, 1971, Ser. No. 116,282

Int. Cl. C07d *27/08*

U.S. Cl. 260—326.3 **1 Claim**

A new alkylene bis-pyrrolidone-formaldehyde addition product was prepared by the base catalyzed addition of ethylidenebis-3-(2-pyrrolidone) to formaldehyde in mole ratios of about from 1:1 to 1:3 in aqueous solvent. The neutralized solutions prepared of the new chemical compound were used effectively to crosslink cotton fabrics employing a pad-dry-cure procedure. The resultant fabrics were found to be wrinkle resistant and to have resistance to chlorine damage, and the crosslinks were resistant to acid and basic hydrolysis.

3,714,184

SUCCINIMIDE-CONTAINING DYESTUFFS

Gilbert Victor Henri Kremer, 95 Ermont, France, assignor to Ugine Kuhlmann, Paris, France

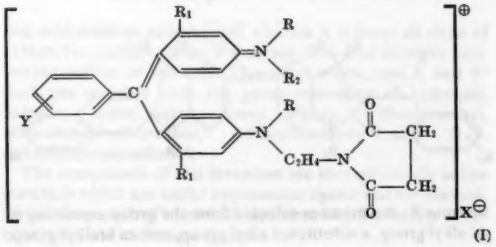
Filed Oct. 1, 1969, Ser. No. 862,921

Claims priority, application France, Oct. 10, 1968, 68196358

Int. Cl. C07d *27/10*

U.S. Cl. 260—326.3 **9 Claims**

Dyestuffs of the formula:



(I)

wherein R represents a hydrogen atom or an alkyl or alkyl-O-alkyl group, the alkyl groups containing one to four atoms of carbon, R_1 represents a hydrogen atom or a methyl group, R_2 represents a alkyl group containing one to four carbon atoms, or a cycloalkyl, aryl, aralkyl or succinimidoethyl group, Y represents a hydrogen or halogen atom or an alkoxy, nitro, cyano, or amino group, and X represents a monovalent anion and processes for their manufacture.

These dyestuffs are particularly suitable for the coloration of fibers based on polymers or copolymers of acrylonitrile.

3,714,185

PROCESS FOR THE PREPARATION OF 2-PYRROLIDONE

John J. McCoy, Boothwyn, Pa., and Jin Sun Yoo, South Holland, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,793

Int. Cl. C07d *27/08*

U.S. Cl. 260—326.5 FN **7 Claims**

The use of certain complexes of cobalt and rhodium containing phosphine either either unsupported or supported, as catalysts for the cyclo-carbonylation reaction.

3,714,186

7-(1-PYRROLIDINYL)-ENDO-7-NORCARANOL AND ITS METHOD OF PREPARATION

Jacob Szmuszkovicz, and Elisabeth S. Cerda, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 791,143, Jan. 14, 1969, abandoned. This application June 2, 1971, Ser. No. 149,380

Int. Cl. C07d *27/02*

U.S. Cl. 260—326.5 R **5 Claims**

A process for the preparation of endo-7-norcaranol and intermediate compounds prepared by said process.

3,714,187

SPIRO(INDOLINE-2,2'-2H'-CHROMENE)PHOTOCHROMIC COMPOUNDS

Hisatake Ono; Chiaki Osada, and Harumi Katsuyama, all of Asaka-shi, Saitama, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

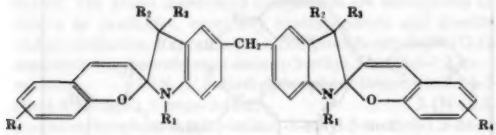
Filed March 18, 1970, Ser. No. 20,761

Claims priority, application Japan, March 18, 1969, 44/20657

Int. Cl. C07d *27/38*

U.S. Cl. 260—326.11 **2 Claims**

Photochromic compounds having the formula



wherein R_1 is a member selected from the group consisting of an alkyl group, a substituted alkyl group, and an aralkyl group; wherein R_2 and R_3 each is a member selected from the group consisting of an alkyl group and a phenyl group; and, wherein R_4 is a member selected from the group consisting of an alkyl group, a nitro group, a halogen atom, an aldehyde group, an alkoxyl group, a carboxyl group, and a carboxylic acid ester group; said alkyl group having from one to five carbon atoms are disclosed. The compounds are useful in recording media where their ability to change color on activation with ultraviolet light is advantageous.

3,714,188

PROCESS FOR THE PREPARATION OF 3-ARYL-2-IMINO-3-INDOLINOLS AND 2-AMINO-3-ARYL-3H-INDOL-3-OLS AND RELATED COMPOUNDS

Stanley C. Bell, Penn Valley, Pa., and Carl Gochman, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 752,488, Aug. 14, 1968, Pat. No. 3,577,435, which is a continuation-in-part of Ser. No. 694,066, Dec. 28, 1967, Pat. No. 3,576,001. This application Dec. 9, 1970, Ser. No. 96,654

Int. Cl. C07d *27/56*

U.S. Cl. 260—326.15 **6 Claims**

A new process is disclosed reacting a 2-benzoyl acylanilide with ionic cyanides to form new 3-aryl-2-imino-3-indolinols and 2-amino-3-aryl-3H-indol-3-ols. These products may be further reacted to form a number of new derivatives which have pharmacological activity as central nervous system depressants.

3,714,189

PHENYLATED PYROMELLITIMIDES

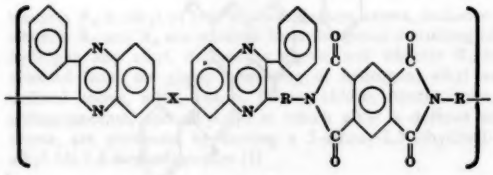
Joseph M. Augl, Sterling Park, Va., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Original application Sept. 24, 1970, Ser. No. 75,248, now Patent No. 3,642,700. Divided and this application July 22, 1971, Ser. No. 165,347

Int. Cl. C07d *27/52*

U.S. Cl. 260—326 C **2 Claims**

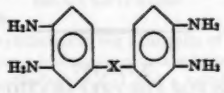
Phenylated imide-quinoxaline copolymers consisting essentially of units of the formula

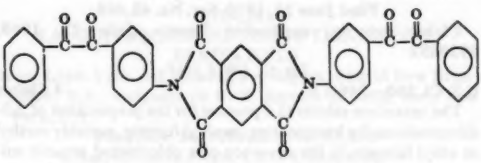


wherein X is a direct bond,

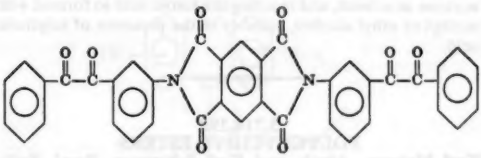
O, —C—, S, SO and SO_2
‖
O

and R is m- or p-phenylene which are useful as coatings for fibers, graphite precursors, films and laminating materials are prepared by contacting





or



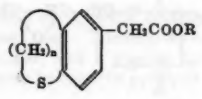
3,714,190

6-THIOCHROMAN-ACETIC-ACID COMPOUNDS

Jacques Robert Boissier, Paris, and Roger Ratcuis, Saint-Cloud, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Feb. 3, 1971, Ser. No. 112,407
Claims priority, application France, Feb. 10, 1970, 7004619
Int. Cl. A61k 27/00; C07d 65/08
U.S. Cl. 260—327 TH 6 Claims

Novel condensed cyclic thio compounds of the formula



(I)

wherein *n* is an integer from 2 to 4 and R is selected from the group consisting of hydrogen, alkyl and hydroxy alkyl of 1 to 5 carbon atoms and non-toxic, pharmaceutically acceptable metal salts and nitrogen base salts having analgesic, anti-inflammatory and anti-pyretic activity and their preparation.

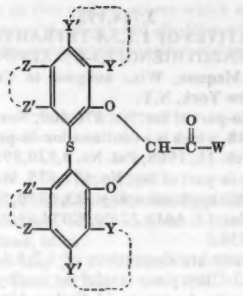
3,714,191

DIOXATHIOCIN CARBOXYLIC ACIDS, ESTERS, SALTS AND AMIDES

Roger Alan Parker, Cincinnati, Ohio, assignor to Richardson Merrell Inc., New York, N.Y.

Filed Sept. 13, 1971, Ser. No. 180,117
Int. Cl. A61k 27/00; C07d 89/20
U.S. Cl. 260—327 B 14 Claims

Novel dioxathiocin carboxylic acids, esters, salts and amides, which reduce blood lipids in warm blooded animals, are useful in the treatment of hyperlipidemic states and possess anti-infective properties, are represented by compounds of the following formula:



Formula I

wherein each Y, Y', Z and Z' represent hydrogen, halogen such as chlorine, fluorine, bromine or iodine, or lower alkyl or from one to four carbon atoms; or each set of Y and Y' or each set of Z and Z' forms a napthalene ring which may be unsubstituted or substituted with a substituent selected from a halogen atom such as chlorine, fluorine, bromine or iodine or lower alkyl of from one to four carbon atoms; W represents hydroxy, lower alkoxy of from one to four carbon atoms; or $-NR^1R^2$; R^1 and R^2 represent hydrogen or lower alkyl of from 1 to 4 carbon atoms and may be the same or different; or R^1 and R^2 taken together with the nitrogen atom to which each is attached form a saturated monocyclic heterocyclic group such as pyrrolidino, piperidino, morpholino, piperazino or N-(lower)-alkyl-piperazino.

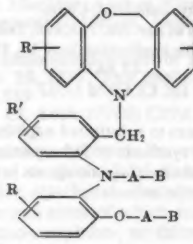
3,714,192

DERIVATIVES OF 5,11-DIHYDRODIBENZOXAZEPINES AND PROCESS THEREFOR

Harry L. Yale, New Brunswick, and Francis A. Sowinski, Edison, both of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 668,632, Sept. 18, 1967, abandoned, which is a continuation-in-part of Ser. No. 438,406, March 9, 1965, abandoned. This application Sept. 28, 1970, Ser. No. 76,285
Int. Cl. C07d 87/54
U.S. Cl. 260—333 7 Claims

This invention relates to novel derivatives of 5,11-dihydrodibenzoxazepines having the formula



and acid-addition salts thereof, wherein A is lower alkylene of at least two carbon atoms, B is a basic saturated nitrogen-containing radical of less than 12 carbon atoms, and R and R' each are selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, trifluoromethyl, trifluoromethylmercapto, trifluoromethoxy and N,N-dimethylamino-sulfonyl.

The compounds of this invention are therapeutically active materials which are useful hypotensive agents and for the control of the growth of tumors. In addition, they find utility as antibacterial and antifungal agents.

3,714,193

DERIVATIVES OF 1,2,3,4-TETRAHYDRO-5H-BENZOTHIENO[2,3-C]AZEPINES

John T. Suh, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 876,600, Nov. 13, 1969, Pat. No. 3,561,068, which is a continuation-in-part of Ser. No. 705,909, Feb. 16, 1968, Pat. No. 3,520,895, which is a continuation-in-part of Ser. No. 621,475, March 8, 1967, abandoned. This application Sept. 23, 1970, Ser. No. 74,827

Int. Cl. A61k *27/00*; C07d *63/22*

U.S. Cl. 260—330.5 4 Claims

The compounds are derivatives of 1,2,3,4-tetrahydro-5H-benzothieno[2,3-C]azepines useful as antihypertensive and tranquilizing agents. A compound disclosed is 1-ethyl-1,2,3,4-tetrahydrobenzothieno[2,3-C]azepine.

3,714,194

DI(AZIDOSULFONYL)XANTHONES

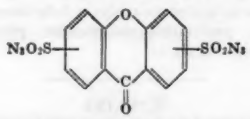
Henri Ulrich, Northford, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 9, 1971, Ser. No. 151,525

Int. Cl. C07d *7/44*

U.S. Cl. 260—335 2 Claims

Di(azidosulfonyl)xanthones are described of the formula:



These compounds are prepared by reaction of the corresponding sulfonylhalides with sodium azide. The di-(azidosulfonyl)xanthones are useful as cross-linking agents in photoresist systems, elastomers and the like. The sulfonylazido groups are sensitive to radiation particularly to ultraviolet light. This sensitivity is enhanced by the presence of the carbonyl groups of the xanthone, i.e., the compounds of the above formula have a built-in sensitizer.

3,714,195

ETHYLENEDIOXY DERIVATIVES OF SUBSTITUTED NAPHTHALENONE COMPOUNDS

Los Marinus, Edinburg, Scotland, assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 708,498, Feb. 27, 1968, Pat. No. 3,565,958. This application June 17, 1970, Ser. No. 47,143

Int. Cl. C07d *13/02*

U.S. Cl. 260—340.9 6 Claims

This invention relates to substituted naphthalen compounds and their use in the synthesis of D-homosteroids. The latter compounds are useful as estrogenic agents in the treatment of laboratory and domestic animals.

3,714,196

AMINOACETALS AND AMINOKETALS, PROCESSES FOR THEIR MANUFACTURE AND THEIR USE

Helmut Zondler, Allschwil, Switzerland, and Wolfgang Pfleiderer, Konstanz, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Apr. 20, 1971, Ser. No. 135,774

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 6 Claims

New acetals or ketals substituted in the α-position by at least two aminopropyl groups, for example 2,2-bis(γ-aminopropyl)propionaldehyde - glycol - acetal or 1,1,1-tris(γ-aminopropyl) acetone-ethylene glycol-acetal, are manufactured by catalytically hydrogenating acetals or ketals substituted by at least two β-cyanoethyl groups in the α-position.

The new compounds are valuable curing agents for epoxide resins.

3,714,197

PROCESS FOR THE PREPARATION OF 2,3-DIBROMFURAN

Bernard Majoie, Dijon, France, assignor to Societe De Recherches Industrielles S.O.R.I., Dijon, France

Filed June 22, 1970, Ser. No. 48,460

Claims priority, application France, June 23, 1969, 6920892

Int. Cl. C07d *5/18*

U.S. Cl. 260—346.1 R 4 Claims

The invention relates to a process for the preparation of 2,3-dibromofuran by brominating an alkyl furoate, suitably methyl or ethyl furoate, in the presence of a chlorinated organic solvent; saponifying the brominated ester; decarboxylating the saponified ester and recovering the 2,3-dibromofuran. The furoate ester is conveniently prepared by oxidizing furfural with potassium permanganate, preferably in the presence of acetone as solvent, and reacting the furoic acid so formed with methyl or ethyl alcohol, suitably in the presence of sulphuric acid.

3,714,198

POLYGLYCIDYL ESTERS

Karl Metzger, Aesch, and Karl Scheuzger, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

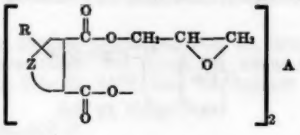
No Drawing. Continuation-in-part of applications Ser. No. 656,363, July 27, 1967, now abandoned, and Ser. No. 793,876, Jan. 24, 1969, the latter being a continuation-in-part of application Ser. No. 656,363. This application Jan. 18, 1971, Ser. No. 107,497

Claims priority, application Switzerland, July 29, 1966, 10,997/66

Int. Cl. C07d *1/18*

U.S. Cl. 260—348 A 1 Claim

New polyglycidyl esters of the formula



where Z stands for an at least partially hydrogenated benzene ring in which the two esterified carboxyl groups are linked with vicinal cyclic carbon atoms, R for a hydrogen atom or a methyl group and A for a divalent cycloaliphatic group.

3,714,199

METHYLENE DIOXYAMINE

Curtis S. McDowell, Edwards, and Claude Merrill, Lancaster, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force

Filed March 17, 1970, Ser. No. 24,945

Int. Cl. C07e *83/00*

U.S. Cl. 260—350 2 Claims

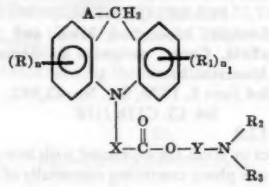
A method for synthesizing the novel compound methylenedioxyamine through a reaction which involves the hydrolysis of methylene-O,O'-bis (ethylacethydroximate).

3,714,200
ACID SALTS OF METHYLENEDIOXYAMINE
Curtis S. McDowell, Edwards, and Claude Merrill, Lancaster, both of Calif., assignors to The United States of America as represented by the Air Force
Filed March 17, 1970, Ser. No. 24,969
Int. Cl. C07c 83/00
U.S. Cl. 260—350 8 Claims

A method for synthesizing the acid salts of methylenedioxyamine by effecting a hydrolytic reaction between methylene-O,O'-bis (ethylacethydroximate) and a suitable acid such as hydrochloric, perchloric, nitric, hydrobromic, sulfuric, nitroform, or picric.

3,714,201
5,11-DIHYDRODIBENZOXA(OR THIA) ZEPINE DERIVATIVES
Harry Louis Yale, and Ramesh B. Petigara, both of New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.
Filed Nov. 24, 1970, Ser. No. 92,498
Int. Cl. A61k 27/00; C07d 87/54, 93/42
U.S. Cl. 260—333 5 Claims

5,11-Dihydrodibenzoxa(or thia)zepine derivatives are provided having the structure



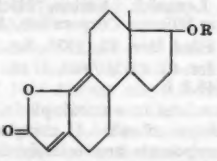
wherein A is O, S, SO or SO_2 and R, R_1, R_2, R_3, X, Y, *n* and n_1 are as defined hereinafter. These compounds are useful in lowering blood-pressure and as anti-inflammatory agents.

3,714,202
VINYL GLYCEROL ACETALS
Glenn M. Nakaguchi; Ting-I Wang, both of Fullerton, and Frederick F. Caserio, Jr., Laguna Beach, all of Calif., assignors Atlantic Richfield Company, Philadelphia, Pa.
Filed July 15, 1969, Ser. No. 841,983
Int. Cl. C07d 13/04
U.S. Cl. 260—340.7 6 Claims

Two classes of vinyl cyclic acetal compounds, 2-methyl-5-vinyloxy-1,3-dioxane and 2-methyl-4-vinyloxymethyl-1,3-dioxolane in particular, and a process for preparing compounds of these classes by catalytic pyrolysis are disclosed.

3,714,203
1-OXA-A-NOR STEROIDS
Lucien Nedelec, Clich-sous-Bois, and Vesperto Torelli, Maisons-Alfort, both of France, assignors to Roussel Uclaf, Paris, France
Filed July 7, 1969, Ser. No. 839,659
Claims priority, application France, July 9, 1968, 68158476
Int. Cl. C07d 5/10
U.S. Cl. 260—343.3 5 Claims

1-oxa-A-Nor steroids of the formula



I

wherein R is selected from the group consisting of hydrogen, acyl of an organic carboxylic acid of one to 18 carbon atoms and alkyl of one to five carbon atoms which may be further substituted with an aryl, alkoxy and alkylthio which have anti-androgenic activity and their preparation and use.

3,714,204
PELLETIZED SILICONE RUBBER
Peter Lamont, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed May 22, 1970, Ser. No. 39,915
Int. Cl. C08g 51/04, 31/02
U.S. Cl. 260—37 SB 43 Claims

Pellets of a silicone rubber stock containing silicon-bonded vinyl radicals and a platinum catalyst and pellets of a silicone rubber stock containing a silicon compound containing at least three silicon-bonded hydrogen atoms per molecule are present in a mixture sufficient to provide a vulcanizable composition when massed. The vulcanizable composition is useful for extruding on wire and for other silicone rubber products.

3,714,205
PROCESS FOR THE MANUFACTURE OF BLUE DISPERSION DYESTUFFS
Eduard Moergeli, Muttenz, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland
No Drawing. Filed Oct. 22, 1969, Ser. No. 868,587
Claims priority, application Switzerland, Oct. 30, 1968, 16,181/68; Sept. 12, 1969, 13,828/69
Int. Cl. C09b 1/50
U.S. Cl. 260—380 7 Claims

Process for the manufacture of blue dispersion dyestuffs, wherein a 1,5-dibromo-4,8-diacylaminoanthraquinone or a 1,8-dibromo-4,5-diacylaminoanthraquinone is heated with sulphuric acid, optionally containing SO_3, in the presence of boric acid and the resulting bromine-containing 1,5-dihydroxy-4,8-diamino- or 1,8-dihydroxy-4,5-diamino-anthraquinone is optionally treated with an alkylating agent.

3,714,206
BENZO-2,3,1-DIAZABORINES
Heinrich Huemer, Zweifall, Siegfried Herrling, Stolberg, and Heinrich Muckter, Aachen, Germany, assignors to Chemie Gruenenthal GmbH, Stolberg im Rhineland, Germany
No Drawing. Continuation-in-part of application Ser. No. 633,390, Apr. 25, 1967. This application Dec. 2, 1968, Ser. No. 780,569
Int. Cl. A61k 27/00; C07d 107/02
U.S. Cl. 260—397.7 20 Claims

Boron containing heterocyclic compounds of the benzo-, naphtho-, or thieno-2,3,1-diazaborine type which carry in 1-position attached to the boron atom a hydroxyl group, the hydrogen atom of which may be replaced by a cation, or a benzo-, naphtho-, or thieno-2,3,1-diazaborine group, and in 2-position a sulfo group attached to a substituted or unsubstituted aromatic or heterocyclic radical. The phenylene, naphthylene, or thienylene rings therein may also be substituted. Examples are 1-hydroxy-2-(p-tolyl sulfonyl) benzo-2,3,1-diazaborine; 1-hydroxy-2-(2',4'-dimethyl phenyl sulfonyl) benzo-2,3,1-diazaborine; 1-hydroxy - 2 - (p-amino phenyl sulfonyl) benzo - 2,3,1-diazaborine; 1-hydroxy-2-(thienyl-2'-sulfonyl) benzo-2,3,1-diazaborine; 1-hydroxy-2-(2'-chloro-4'-amino phenyl sulfonyl) benzo-2,3,1-diazaborine, and its 4'-acetamino derivative and its sodium salt; 1-hydroxy-2-[2'-chloro-4'-(β-carboxy ethylene carboxamido) phenyl sulfonyl] benzo-2,3,1-diazaborine and its sodium salt; 1-hydroxy-2-

[2'-chloro-4'-(γ-carboxy propylene carboxamido) phenyl sulfonyl] benzo-2,3,1-diazaborine and its sodium salt.

The new compounds are useful antimicrobial agents and are especially effective against gram-negative bacteria, trypanosomas, and plasmodia. They possess cytostatic, antiphogistic, and other pharmacological activities. Some of them are good diuretic agents. They have a pronounced synergistic effect on antibiotics.

The compounds are prepared by condensing o-formyl phenyl boric acids, 2-formyl thienyl-(3)-boric acid, 3-formyl thienyl-(4)-boric acid, 1-formyl naphthalene-(2)-boric acid, 2-formyl naphthalene-(1)- or -(3)-boric acids, and others, or derivatives thereof with corresponding sulfonic acid hydrazides.

3,714,207

1α, 2α; 6β, 7β-DIMETHYLENE STERIODS

Helmut Hofmeister; Hermann Steinbeck, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

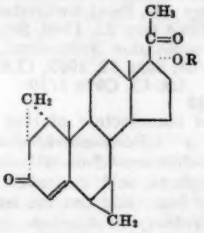
Filed May 1, 1970, Ser. No. 33,961

Claims priority, application Germany, May 2, 1969, P 19 23 378.4

Int. Cl. C07c *169/34*

U.S. Cl. 260—397.4 **6 Claims**

1α,2α;6β,7β-Dimethylene-17α-oxy-progesterones of the formula



wherein R is H or an acyl radical, have progestational activity without ovulation inhibiting activity.

3,714,208

13-AMINOGONANES AND N-ACYL AND N-ALKYL DERIVATIVES THEREOF

Thomas B. Windholz, Westfield; David B. R. Johnston, Warren, and Arthur A. Patchett, Cranford, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 771,327, Oct. 28, 1968, abandoned. This application April 7, 1971, Ser. No. 132,242

Int. Cl. C07c *169/10*

U.S. Cl. 260—397.4 **17 Claims**

13-Amino steroids and 13-substituted amino steroids of the gonane series prepared by total synthesis starting from initial condensation of a 2-acyl-amino-cyclopentane-1,3-dione and the isothiuronium salt derived from 6-alkoxy-1-vinyl-1,2,3,4-tetrahydro-1-naphthol. The condensation product is then cyclicized and hydrogenated to obtain, successively, 8,14-bis-dehydro-13-acylamino-18-norestrone alkyl ether and 8-dehydro-13-acylamino-18-norestrone alkyl ether and finally, by reduction, the 8-dehydro-13-acylamino-18-norestradiol analog. The latter compound is further reduced to obtain 13-acylamino-18-norestrone alkyl ether and then 13-amino-18-norestradiol alkyl ether after hydrolysis. The 13-acylamino compound is then, by Birch reduction and deacetylation, converted to 13-amino-18,19-bisnortestosterone. The 13-amino group is alkylated to obtain a 13-alkylamino-18,19-bisnortestosterone. The compounds exhibit anti-androgenic activity and are useful for control of fertility and for control of the menstrual cycle.

3,714,209

ISOPROPYLIDINEAMINOETHANOL SALT OF P-NITROBENZENESULFONYLUREA

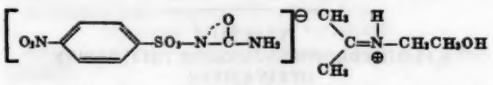
Ching C. Tung and Jack F. Powers, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Original application Mar. 28, 1969, Ser. No. 811,629, now Patent No. 3,628,946. Divided and this application Feb. 22, 1971, Ser. No. 117,786

Int. Cl. C07c *143/80*

U.S. Cl. 260—397.7 **1 Claim**

A novel salt of p-nitrobenzenesulfonylurea having the formula



which is formed by the reaction of p-nitrobenzenesulfonylurea with ethanolamine and acetone.

This compound has herbicidal activity.

3,714,210

PROCESS FOR EXTRACTING FULL FAT SOYBEAN FLAKES OR MEAL

Richard G. Schweiger, Muscatine, Iowa, and Siegfried A. Muller, Ridgefield, Conn., assignors to Grain Processing Corporation, Mascatin, Iowa

Filed June 5, 1970, Ser. No. 43,982

Int. Cl. C11b *1/10*

U.S. Cl. 260—412.8 **5 Claims**

Soybean flakes or meal are extracted with two-phase liquid solvent system; one phase consisting essentially of one or more lipophilic solvents and the other phase consisting essentially of a mixture of water and one or more water-miscible solvents. Oil and non-proteinaceous materials are simultaneously extracted providing a soy protein concentrate product which is light in color and bland in taste.

3,714,211

COMPLEX TRINUCLEAR METAL SALTS

Hans Erdmann, Heidelberg, and Franz Friedrich Miller, Ludwigshafen, both of Germany, assignors to Badische Anilin - & Soda - Fabrik Aktiengesellschaft, Ludwigshafen/Rhein and Rheinland-Pfalz, Germany

Filed Sept. 3, 1970, Ser. No. 69,461

Int. Cl. C07f *11/00*

U.S. Cl. 260—438.5 R **12 Claims**

Complex trinuclear metal salts, methods for the production of these salts by reaction of salts of aluminum or of aluminum and trivalent chromium, which contain monovalent anions, with acrylic acid and the amount of an alkaline reacting agent necessary for their neutralization or with salts or acrylic acid and a method of tanning using these metal salts.

3,714,212

COBALT-PLATINUM CATALYST

Guenther Fritz Lengnick, Adrian, Mich., assignor to Stauffer-Wacker Silicone Corporation, Adrian, Mich.

No Drawing. Filed Dec. 30, 1971, Ser. No. 214,445

Int. Cl. C07f *7/08, 7/18*

U.S. Cl. 260—448.2 E **9 Claims**

The invention relates to a cobalt-platinium catalyst for effecting the addition of ≡Si—H compounds to unsaturated organic compounds and esterification of ≡Si—H compounds with compounds having an active hydrogen in the presence of platinum containing catalysts.

3,714,213

METHOD OF MAKING CYCLOPOLYSILOXANES CONTAINING SILANIC HYDROGEN

Carl J. Miller, Cohoes, and William P. Ryan, Waterford, both of N.Y., assignors to General Electric Company

Filed Jan. 6, 1971, Ser. No. 104,481
Int. Cl. C07f 7/08
U.S. Cl. 260—448.2 E 10 Claims

Cyclopolysiloxanes containing both methyl substituents and silanic hydrogen substituents are prepared by catalytically cracking and cyclizing polysiloxanes containing methyl substituents, hydrogen substituents and high molecular weight chain terminal groups, such as hexyldimethylsilyl groups. The catalyst used in the cracking and cyclizing step is an acid treated clay or synthetic alumina silicate. Tetramethylcyclotetrasiloxanes formed by this process are reacted with diethylhydroxyl amine to form tetramethyltetra(diethylaminoxy) cyclotetrasiloxanes. The aminoxy compounds are then used to crosslink silanol stopped polydimethylsiloxane fluids to form elastomers.

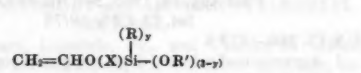
3,714,214

ALKOXY SILYL ALKYL COMPOUNDS

Matthew Edward Hermes, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed April 28, 1970, Ser. No. 32,739
Int. Cl. C07d 103/04; C07f 7/02
U.S. Cl. 260—448.8 R 2 Claims

A silyl vinyl ether having the formula



wherein X is an alkylene group of two to 10 carbon atoms, or an alkyleneoxyalkylene group of four to 16 carbon atoms, R is an alkyl group of one to six carbon atoms, y is 0, 1, or 2, and R′ is an alkyl group of one to six carbon atoms; silyl fluoroolefin polymers made by polymerizing the silyl vinyl ether with fluoroolefins, and, optionally, with other vinyl ethers and/or ethylene and/or propylene and/or fluorine-substituted vinyl ether; compositions containing polysilicic acid and silyl fluoroolefin polymer made by polymerizing the silyl vinyl ether with fluoroolefin, and, optionally, with other vinyl ethers; coating compositions containing a compatible solvent and the polysilicic acid/silyl fluoroolefin polymer composition; articles coated with the silyl-fluoroolefin polymer/polysilicic acid composition and a process for coating them; and polymers made by polymerizing the silyl vinyl ether with formaldehyde or trioxane and, optionally, with alkylene oxides and/or dioxolane and/or alkyl vinyl ethers.

3,714,215

N,N-DIALKYL SUBSTITUTED ETHOXYMETHYLENE IMMONIUM HALIDES AND METHOD

Pierre Marie Joseph Ghislain de Radzitzky d'Ostrowick and Alain Joseph Guillaume de Roocker, Brussels, Belgium, assignors to Labofina, Soc. Am., Brussels, Belgium

No Drawing. Filed Mar. 23, 1970, Ser. No. 22,031
Int. Cl. C07c 119/18, 119/20, 119/16
U.S. Cl. 260—453 R 10 Claims

N,N-dialkyl(2-halo-1-substituted ethoxymethylene)immonium halides are formed by halogenation of olefines in the presence of N,N-dilower alkyl formamide to form new compounds and derivatives. The compounds are decomposed to valuable 1,2-dihalocompounds, 1-halo-2-formates and halohydrins by thermal decomposition, hydrolysis or alcoholysis.

3,714,216

PROCESS FOR PREPARING AROMATIC ISOCYANATES

Wilhelm J. Schnabel, Branford; Ehrenfried H. Kober, Hamden, and Theodore C. Kraus, Cheshire, all of Conn., assignors to Olin Mathieson Chemical Corporation

Filed Feb. 28, 1967, Ser. No. 619,158
Int. Cl. C07c 119/04
U.S. Cl. 260—453 PC 12 Claims

The process for preparing an organic isocyanate by reacting an organic nitro compound with carbon monoxide in the presence of a catalytic system comprised of a mixture of at least one compound selected from the group consisting of palladium halides, rhodium halides, palladium oxides, and rhodium oxides, with at least one oxide of an element selected from the group consisting of vanadium, molybdenum, tungsten, niobium, chromium, and tantalum.

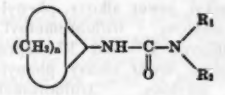
3,714,217

BICYCLO[n.1.0]N-ALKYL-N′-ALKOXY UREAS AS HERBICIDES

Elmar Sturm, Arlesheim, and Christian Vogel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Dec. 18, 1969, Ser. No. 886,356
Claims priority, application Switzerland, Dec. 23, 1968, 19,152/68
Int. Cl. C07c 119/16
U.S. Cl. 260—453 R 2 Claims

Bicyclo[n.1.0]alkyl-ureas of the formula



wherein

R_1 represents hydrogen, a lower alkyl or alkoxy radical, R_2 represents a lower alkyl, alkenyl or alkynyl radical, and n represents an interger of from 3 to 6

are disclosed as herbicidally active compounds. Herbicidal compositions and a method of controlling undesirable plant growth with the aid of such compounds are also described.

3,714,218

3-BENZOYL-3-THIOCYANATOPROPIONIC ACID, ALKYL ESTERS AND DERIVATIVES THEREOF

Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sept. 3, 1970, Ser. No. 69,455
Int. Cl. C07c 161/02
U.S. Cl. 260—454 9 Claims

3-Benzoyl-3-thiocyanatopropionic acid, alkyl esters are prepared by the reaction of a 3-benzoyl-3-halopropionic acid alkyl ester with an alkali metal thiocyanate. The products so produced exhibit antitubercular activity.

3,714,219

CARBONATES OF 3′- AND 4′-HYDROXY BROMOACETANILIDES

Don R. Baker, Orinda, and Eugene G. Teach, El Cerrito, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application Mar. 12, 1969, Ser. No. 806,717. Divided and this application Mar. 24, 1971, Ser. No. 127,750
Int. Cl. C07c 103/38; C11d 3/48
U.S. Cl. 260—463 1 Claim

Bromoacetanilides as new compositions and their activity as microbiocides. Representative compounds include 3′-hydroxy bromoacetanilide, 3′-(N-methylcarbamoyloxy) bromoacetanilide, 3′-(N-isopropylcarbamoyloxy)bromoacetanilide, 3′-(N-allylcarbamoyloxy) bromoacetanilide and 4′-hydroxy bromoacetanilide.

3,714,220

MYRCENE-METHACRYLONITRILE ADDUCTS

Robert T. Dahill, Jr., Perth Amboy, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Filed Dec. 29, 1969, Ser. No. 888,956
Int. Cl. C07c *121/48*
U.S. Cl. 260—464 1 Claim

There is provided a novel adduct of myrcene and methacrylonitrile which is useful as an odorant in the perfume industry. The adduct possesses a sweet floral odor suggestive of nasturtium, and moreover, possesses a remarkable stability to oxidation.

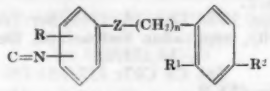
3,714,221

ANTIMICROBIAL ISOCYANIDES

Harry L. Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 758,115, Sept. 6, 1968, abandoned. This application Dec. 14, 1970, Ser. No. 98,106
Int. Cl. C07c *121/52*
U.S. Cl. 260—465 F 4 Claims

Isocyanides of the formula



wherein Z represents oxygen or sulfur; R represents hydrogen, halogen, lower alkyl, lower alkoxy, phenyl-lower alkylene, phenyl-lower alkyloxy, trifluoromethyl, cyano, or dimethylaminosulfonyl; R^1 and R^2 represent hydrogen, halogen, lower alkyl, lower alkoxy, phenyl-lower alkylene, phenyl-lower alkyloxy, trifluoromethyl, cyano, dimethylaminosulfonyl, or isocyanido; and *n* is 1 or 2, provided that at least one of R^1 and R^2 is hydrogen, and that when R is other than hydrogen, R and the isocyanido group are positioned, respectively, either ortho and para or para and ortho with respect to Z. These compounds possess utility as antibacterial and parasiticidal agents. They have also demonstrated activity as CNS depressants.

3,714,222

PREPARATION OF DIAMINOMALEONITRILE BY CHEMICAL REDUCTION OF DIIMINOSUCCINONITRILE

Donald R. Hartter, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 745,955, July 19, 1968, Pat. No. 3,551,473. This application Aug. 3, 1970, Ser. No. 60,725
Int. Cl. C07c *121/20*
U.S. Cl. 260—465.5 R 8 Claims

The process for the production of diaminomaleonitrile (HCN tetramer) by the reduction of diiminosuccinonitrile by certain chemical reducing agents, e.g., hydrogen sulfide or phenylhydrazine, is described.

3,714,223

PROCESS FOR PREPARING AMINONITRILES

John J. Godfrey, and Charles R. Morgan, both of Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 636,662, May 8, 1967, Pat. No. 3,515,742. This application Dec. 15, 1969, Ser. No. 885,107
Int. Cl. C07c *121/42*
U.S. Cl. 260—465.5 A 6 Claims

An aminonitrile having the formula $R—N=(CH_2CN)_2$, where R is a straight chain non-branched alkyl group having about one to 12 carbon atoms, is prepared by; (a) mixing a primary amine having the formula $R—NH_2$, where R is as defined supra, formaldehyde, and water to form a first mixture; (b) cooling the first mixture to about 0–35°C.; (c) adding sulfuric acid and water in a weight ratio of sulfuric acid, as H_2SO_4, to water of about 1:0.5–4, to the first mixture while cooling to maintain the temperature of the resulting second mixture within the range of about 0–35°C., the mole ratio of amine to H_2SO_4 being about 1:0.1–1.5; (d) adding hydrogen cyanide to the second mixture, the mole ratio of amine to hydrogen cyanide being about 1:1.8–2.5 to form a third mixture; and (e) forming the aminonitrile product and a mother liquor by maintaining the third mixture in a closed reaction zone under substantially adiabatic conditions for about 10–300 minutes.

3,714,224

ACETYLENIC CARBAMATES

Derek William Hills, Welwyn Garden City, and George Sidney Sach, Welwyn, England, assignors to Smith Kline and French Laboratories Limited, Welwyn Garden City, Hertford County, England

No Drawing. Filed Dec. 22, 1969, Ser. No. 887,349
Claims priority, application Great Britain, Dec. 10, 1968, 58,725/68
Int. Cl. C07c *125/06*
U.S. Cl. 260—468 C 11 Claims

The compounds are 4-(N-cyclopropylcarbamoyloxy)-2-butynyl-tri-lower alkylammonium salts having ganglion stimulant activity and intermediates in the preparation thereof.

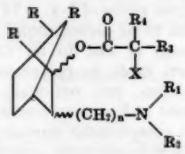
3,714,225

ESTERS OF BICYCLIC AMINOALCOHOLS

Claude I. Judd, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 18, 1965, Ser. No. 481,447
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 A 16 Claims

1. A compound selected from the group consisting of compounds of the formula



wherein R is hydrogen or methyl, R_1 and R_2 are hydrogen, lower alkyl, aryl and aralkyl, R_3 and R_4 are lower alkyl, cycloalkyl or aryl, X is hydrogen or hydroxyl and *n* is zero or one, and pharmaceutically acceptable salts thereof.

9. 2-benzilyloxy-3(N,N-dimethylaminomethyl)bicyclo-[2.2.1]heptane.

3,714,226

PHENYL BENZOIC ACID COMPOUNDS

William V. Ruyle, Scotch Plains; Lewis H. Sarett, Skillman, and Alexander R. Matzuk, Colonia, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 699,022, Jan. 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 577,819, Sept. 8, 1966, abandoned, which is a continuation-in-part of Ser. No. 420,823, Dec. 23, 1964, abandoned. This application June 9, 1970, Ser. No. 44,865. The portion of the term of this patent subsequent to Aug. 1, 1989, has been disclaimed.
Int. Cl. C07c *69/78*
U.S. Cl. 260—473 S 11 Claims

The invention relates to substituted 5-(phenyl)benzoic acids, esters and non-toxic pharmaceutically accepted salts thereof and processes for their preparation. The substituted 5-(phenyl)benzoic acids are useful as anti-inflammatory compounds.

3,714,227

PROCESS FOR THE PREPARATION OF P-HYDROXYBENZOIC ACID ESTER ALKALI METAL SALTS

Ryuzo Ueno, and Tetsuya Miyazaki, both of Nishinimiya, Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyajo, Higashi-ku, Osaka, Japan

Filed Sept. 4, 1970, Ser. No. 69,917
Int. Cl. C07c *69/78*
U.S. Cl. 260—473 S 7 Claims

A process for the preparation of alkali metal salts of p-hydroxybenzoic acid esters, which comprises reacting a p-hydroxybenzoic acid ester with an alkali metal phenoxide.

3,714,228

PREPARATION OF ESTERS

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 14, 1970, Ser. No. 70,620
Int. Cl. C07c *69/14, 69/54, 69/78*
U.S. Cl. 260—476 R 9 Claims

The esterification of carboxylic acids with carbinols is effected in the presence of a catalyst comprising a palladium salt or palladium complex at esterification conditions. The reaction is exemplified by the reaction of benzoic acid with benzyl alcohol in the presence of palladium acetate to produce benzyl benzoate.

3,714,229

ESTERS OF 3-HYDROXY-α-(1-AMINOETHYL)-BENZYL ALCOHOL

Walfred S. Saari, Lansdale, Pa., and Charles S. Miller, deceased, late of Norristown, Pa. (by Ruth A. Miller, executrix), assignors to Merck & Co. Inc., Rahway, N.J.

Filed July 10, 1969, Ser. No. 845,120
Int. Cl. C07c *93/20*
U.S. Cl. 260—477 15 Claims

Novel derivatives of 3-hydroxy-α-(1-aminoethyl)-benzyl alcohol, particularly ester derivatives of erythro or threo 3-hydroxy-α-(1-aminoethyl)-benzyl alcohol and the corresponding 3-ether and 3-ester derivatives thereof, are described. Processes for preparing such novel compounds are also described. The novel compounds are useful as antihypertensive agents and inhibitors of gastric secretion.

3,714,230

DINITROPHENYL ESTER PESTICIDES

Max Pianka, St. Albans, England, assignor to The Murphy Chemical Company Limited, Wheathampstead, St. Albans, England

Filed July 24, 1969, Ser. No. 844,627
Int. Cl. C07c *69/34, 69/40, 69/60*
U.S. Cl. 260—479 S 17 Claims

2-Butyl-4,6-dinitrophenyl and e.g. alkyl mixed esters of aliphatic dicarboxylic acids, the esters having pesticidal activity including insecticidal and selective herbicidal activities.

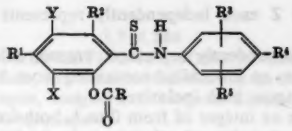
3,714,231

PRODUCTION OF 2-ACYLOXY-THIONOBENZAMIDES

Heinrich Kolling, and Jurgen Kurz, both of Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 9, 1969, Ser. No. 865,192
Claims priority, application Germany, Oct. 25, 1968, P 18 05 156.4
Int. Cl. C07c *69/78*
U.S. Cl. 260—477 3 Claims

2-Acyloxy-thionobenzamides of the formula:



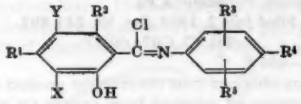
wherein

R^1 and R^2 are the same or different and are hydrogen, lower alkyl, or lower alkoxy,

R^3, R^4, R^5, X and Y are the same or different and are hydrogen, halogen, lower alkyl, lower alkoxy, lower alkyl-mercapto, hydroxyl, nitro or halo-alkyl, and

R is unsubstituted or substituted alkyl, unsubstituted or substituted aryl or unsubstituted or substituted aralkyl,

are produced by reacting an imide chloride of the formula:



wherein

R^1, R^2, R^3, R^4, R^5, X and Y are as above defined, with a thioacid of the formula:

$$R - CO - SH$$

wherein

R is as above defined, optionally in the presence of an inert organic solvent at a temperature of from about 20°C to about 250°C. The 2-acyloxy-thionobenzamides of the present invention are useful in human and veterinary medicine and are particularly useful in treating adult liver-flukes in sheep.

3,714,232

5-ARYLPHENYL SULFONIC ACIDS

Lewis H. Sarett, Princeton, and John Hannah, Matawan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 25, 1969, Ser. No. 836,610
Int. Cl. C07c *143/44, 147/06*
U.S. Cl. 260—479 R 4 Claims

5-Aryl and heteroarylphenyl sulfonic acids and their derivatives are described and the processes for preparing the same are disclosed. These compounds exhibit anti-inflammatory properties and also possess an effective degree of anti-pyretic and analgesic activity.

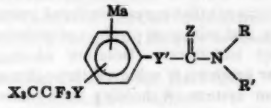
3,714,233

HALOALKOXY- AND HALOALKYLTHIO-PHENYL CARBAMATES

Eric R. Larsen, Lennon H. McKendry, and Fred Y. Edamura, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 1, 1971, Ser. No. 111,686
Int. Cl. C07c *125/06, 155/02, 155/04*
U.S. Cl. 260—479 C 7 Claims

Novel haloalkoxy- and haloalkylthio-phenyl carbamates corresponding to the formula:



wherein

each X independently represents hydrogen, bromo, chloro or fluoro, with the proviso that at least one X is always bromo, chloro or fluoro;

Y, Y' and Z each independently represents oxygen or sulfur;

each M independently represents bromo, chloro, fluoro, iodo, nitro or loweralkyl containing from 1 to about 4 carbon atoms, both inclusive;

a represents an integer of from 0 to 3, both inclusive, and

R and R' each independently represents hydrogen or loweralkyl containing from 1 to about 4 carbon atoms, both inclusive.

The compounds of the present invention are suitable for use as herbicides, fungicides and insecticides.

3,714,234

CATALYSTS AND ESTERIFICATION PROCESS

R. Winslow White, Philadelphia, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed July 2, 1968, Ser. No. 741,892
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 9 Claims

Catalysts are obtained from the reaction product of (a) a tin containing compound selected from organo-tin compounds and inorganic tin oxides and (b) an alkali-metal alkoxide or alkali-metal phenoxide. The catalysts are useful in ester interchange reactions.

3,714,235

METHOD OF PRODUCING D- OR DL-17a-ALPHA-ACETATE OF 3-METHYL ETHER OF D-HOMO-ESTRADIOL

Ardalion Vladimirovich Zakharychev, Tatyana Andreevna Serebryakova, Sofia Nikolaevna Ananchenko, and Igor Vladimirovich Torgov, Moscow, U.S.S.R., assignors to Institut Khimii Prirodnykh Soedineny Im. M.M. Shemyakina Akademii Nauk SSSR, Moscow, U.S.S.R.

No Drawing. Filed June 14, 1971, Ser. No. 152,982
Claims priority, application U.S.S.R., June 12, 1970, 1,437,779
Int. Cl. C07c *67/00*
U.S. Cl. 260—491 3 Claims

A method of producing D- or D,L-17a-acetate of the 3-methyl ether of D-homoestradiol in which 3-methoxy-$\Delta^{1,3,5(10),8(9),14(15)}$-D-homoestrapentaen-17a-$\beta$-ol acetate is reduced by a mixture of trifluoroacetic acid and triethylsilane in the medium of an inert organic solvent, whereupon the final product is isolated. The herein-proposed invention finds application in the synthesis of D-or D,L-19-nor-D-homotestosterone which is a highly active anabolic agent featuring low androgenic activity and is employed as a growth stimulant in farm animals.

3,714,236

PROCESS FOR PRODUCING MIXED ESTERS FROM ALDEHYDES

Howard N. Wright, Jr., and Hugh J. Hagemeyer, Jr., both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 7, 1970, Ser. No. 61,896
Int. Cl. C07c *67/00, 67/06*
U.S. Cl. 260—494 8 Claims

The Tischenko reaction is employed to produce mixed esters from acetaldehyde and isobutyraldehyde with maximum production of ethyl acetate, isobutyl acetate, and isobutyl isobutyrate, and minimum product of undesirable products such as ethyl isobutyrate. Isolation of essentially pure preferred ester products is achieved through a novel continuous distillation system. A holding tank maintained at an elevated temperature with respect to a Tischenko reactor is employed to increase the yield of preferred ester products. Distillation streams containing undesirable impurities and ethyl isobutyrate are cycled to a condensation catalyst reactor for use as catalyst solvent, and to effect conversion of ethyl isobutyrate to preferred ester products.

3,714,237

PROCESS FOR PREPARING VINYL ACETATE

Benedetto Calcagno, Milan; Claudio Divo, Saronno (Varese), and Marcello Ghirga, Bresso (Milan), all of Italy, assignors to Societa' Italiana Resine S.p.A, Milan, Italy

Filed Dec. 10, 1969, Ser. No. 884,007
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 A 8 Claims

In the catalytic production of vinyl acetate from ethylene and acetic acid in the presence of oxygen, the improvement consisting in absorbing by-products, from the gases leaving the reaction vessel, in acetic acid with subsequent recovery of gases absorbed in the acetic acid and separation of ethylene therefrom.

3,714,238

METHOD OF SULFONATING AN OLEFIN MIXTURE

Masuzo Nagayama, Nerima-ku, and Hiroshi Okada, both of Tokyo, Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1969, Ser. No. 882,339
Claims priority, application Japan, Dec. 11, 1968, 43/90239
Int. Cl. C07c *143/02, 143/10, 143/16*
U.S. Cl. 260—513 R 6 Claims

The present invention relates to a method of sulfonating an olefin mixture, in which an olefin mainly consisting of α-olefin having 10–20 carbon atoms is admixed with an olefin mainly consisting of an olefin of vinylidene type having 10–20 carbon atoms in such a way as to make the ratio of said α-olefin to said vinylidene type olefin in the aforementioned olefin mixture range between 95:5 and 70:30 by weight, by the use of an inert gas mixture of SO_3. It is possible by this method to keep the formation of disulfonates extremely low during the sulfonating process and the olefin sulfonates thus obtained have excellent biodegradability, detergency and foaming effect and, when granulated, a very good preservability and are particularly suited for material for a detergent.

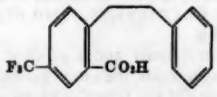
3,714,239

PREPARATION OF 2-PHENETHYL-5-TRIFLUORO-METHYLBENZOIC ACID

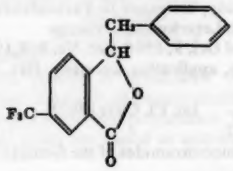
Edward L. Engelhardt, Gwynedd Valley, Pa., assignor to Merck & Co., Rahway, N.J.

No Drawing. Original application May 31, 1966, Ser. No. 553,656, now Patent No. 3,499,037, dated Mar. 3, 1970. Divided and this application Oct. 8, 1969, Ser. No. 864,907
Int. Cl. C07c *63/12*
U.S. Cl. 260—515 A 1 Claim

1. A process for the preparation of the compound of structural formula



which comprises hydrogenating in the presence of a palladium catalyst in a basic medium the compound of structural formula



3,714,240

PRODUCTION OF 0-BENZOYLBENZOIC ACID

Hans Juergen Sturm, and Herbert Armbrust, both of Gruenstadt, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Jan. 18, 1971, Ser. No. 107,593

Claims priority, application Germany, Jan. 28, 1970, P 20 03 599.8; June 12, 1970, P 20 29 027.1; June 13, 1970, P 20 29 248.2

Int. Cl. C07c *65/20*

U.S. Cl. 260—517 9 Claims

The production of o-benzoylbenzoic acid by oxidation of indanes with nitrogen dioxide in the presence of selenium dioxide.

The compound which can be prepared by the process according to the invention is a valuable starting material for numerous syntheses. It is of special significance as a starting material for the production of anthraquinone.

3,714,241

PREPARATION OF α-METHYL-3,4-DISUBSTITUTED PHENYLALANINES

Victor J. Grenda, Warren, N.J., assignor to Merck & Co. Inc., Rahway, N.J.

Division of Ser. No. 619,161, Feb. 28, 1967, Pat. No. 3,553,197. This application Oct. 29, 1969, Ser. No. 870,827

Int. Cl. C07c *101/08*

U.S. Cl. 260—519 8 Claims

α-Methyl-3,4-disubstituted phenylalanines are prepared by a process which comprises converting a 3,4-disubstituted-α-methylcinnamic acid derivative to a 2-methyl-2,3-dihalo-3-(3′,4′-disubstituted phenyl)-propionic acid, reacting the 2,3-dihalo propionic acid with an amine to form a 3-(3′,4′-disubstituted phenyl)-2-methyl-2-aziridine derivative and hydrogenolyzing the aziridine derivative to the desired product. The aziridine derivatives themselves are claimed. The α-methyl-3,4-disubstituted phenylalanines are useful compounds in the treatment of hypertension.

3,714,242

PROCESS FOR THE PREPARATION OF L-DOPA

Gerald Myer Jaffe, Verona, and William Richard Rehl, Upper Montclair, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed July 6, 1970, Ser. No. 52,770

Int. Cl. C07c *101/08*

U.S. Cl. 260—519 6 Claims

The present invention is directed to preparing L-dopa useful as an anti-Parkinson agent directly from the dehydroabietylamine salt of L-N-benzoyl-3-(4-hydroxy-3-methoxyphenyl)-alanine by treating this salt with an aqueous hydrohalic acid.

3,714,243

PROMOTION OF THE OXIDATION OF MONONUCLEAR AROMATIC COMPOUNDS

Louis J. Croce, Seabrook, and Bruno J. Barone, Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

No Drawing. Original application Aug. 28, 1968, Ser. No. 755,775. Divided and this application June 2, 1971, Ser. No. 149,384

Int. Cl. C07c *51/26, 63/02*

U.S. Cl. 260—523 A 5 Claims

A process for the oxidation of mononuclear aromatic compounds having at least one oxidizable group selected from methyl, hydroxymethyl, and aldehyde, at moderate temperatures, and in the presence of oxygen, cobaltous or cobaltic ions, and an effective amount of a specified substituted acid function.

3,714,244

METHOD FOR PURIFYING 1,12-DODECANEDIOIC ACID

Yoshihiko Okada, and Takashi Matsubara, both of Minato-ku, Nagoya, Japan, assignors to Tougosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed April 6, 1971, Ser. No. 131,817

Claims priority, application Japan, April 9, 1970, 45/29772

Int. Cl. C07c *51/42*

U.S. Cl. 260—537 P 8 Claims

Crude 1,12-dodecanedioic acid obtained by oxidation of cyclododecanol and/or cyclododecanone by nitric acid is purified by dissolving the crude 1,12-dodecanedioic acid in an aqueous nitric acid solution containing 40 to 80 percent by weight of nitric acid at 85°–105°C, passing the resulting solution through a filter aid diatomaceous earth having particle sizes of 1–100 microns, cooling the resulting filtrate to 40°–90° C thereby to crystallize 1,12-dodecanedioic acid. The thus purified 1,12-dodecanedioic acid has a good purity and a less susceptibility of discoloration appearing when dissolved in an alkali.

3,714,245

UNSATURATED α-HYDROPERFLUOROALKYLSULFONYL FLUORIDES

Richard Beckerbauer, New Castle, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 25, 1970, Ser. No. 75,693

Int. Cl. C07c *143/70*

U.S. Cl. 260—543 F 2 Claims

New compounds $CF_2{=}CF(CFR)_nCFHSO_2F$ wherein R is F or perfluoroalkyl containing one to five carbon atoms and *n* is an integer of 1 to 5, are prepared by reacting SO_3 with the corresponding fluorocarbon diolefin to form a sultone, reacting the sultone with water, followed by decarboxylation. The compounds of this invention are useful as comonomers with tetrafluoroethylene, in the preparation of stable polymers with ion exchange capabilities.

3,714,246

PROCESS FOR THE PRODUCTION OF 1-HALO-3-METHYL AND 1 - HALO - 2,4 - DIMETHYL-PHOSPHOLENES

Curtis P. Smith, Cheshire, and Henri Ulrich, North Branford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed June 1, 1971, Ser. No. 148,999

Int. Cl. C07d *105/02*

U.S. Cl. 260—543 P 14 Claims

A process is disclosed for preparing 1-halo-3-methylphospholenes and 1-halo-3,4-dimethylphospholenes; said halo being selected from the group consisting of chlorine and bromine. The process comprises reacting an appropriate 1,1-dihalophospholenium halide with a hydrocarbyl phosphine in the presence of an inert organic solvent, and at a temperature of from 0° C. to reflux temperature.

The products of the process are useful as intermediates in a variety of chemical syntheses. For example, they are employed for the preparation of selective solvents, and catalysts for the preparation of carbodiimides from isocyanates.

3,714,247

IMIDOYLBENZENESULFONAMIDES

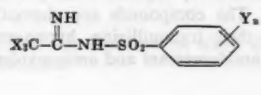
William D. Dixon, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 11, 1970, Ser. No. 97,371

Int. Cl. C07c *143/84*

U.S. Cl. 260—556 AR 12 Claims

The new compounds of this invention are of the formula



where X is independently selected from hydrogen and halogen, with the proviso that X cannot represent more than one iodine; Y is independently selected from hydrogen, halogen, alkyl, haloalkyl of not more than 12 carbon atoms with not more than 3 halogens therein in the 1- and 2-position, and alkoxy of not more than five carbon atoms, and *n* is an integer of 1 through 5. These compounds are useful as herbicides and in controlling the growth of plants.

3,714,248

CYCLOPENTENE DERIVATIVES

Harvey E. Alburn, West Chester, and Horace Fletcher, III, Montgomery, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 777,506, Nov. 20, 1968, Pat. No. 3,594,413. This application Sept. 4, 1970, Ser. No. 69,915

Int. Cl. C07c *103/86*

U.S. Cl. 260—557 R **1 Claim**

This invention is concerned with the preparation of cyclopentene-1,1-dicarboxamides; 1,3-diazaspiro [4,4] nonene-2,4-diones; 1-aminocyclopentene-1-carboxylic acids; 1-(Ntalkylamino)cyclo-pentene-1-carboxylic acids; and 3-oxa-1-azaspiro[4,4] nonene-2,4-diones which are intermediates in the preparation of 6-(1-aminocyclopentene-1-carboxamido)penicillanic acids which are useful antibacterial agents.

3,714,249

HYDROXYALKYLAMINOALKYLAMIDES AND THEIR PREPARATION

Richard V. Norton, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Jan. 22, 1971, Ser. No. 109,045

Int. Cl. C07c *103/38, 103/30*

U.S. Cl. 260—558 R **9 Claims**

Hydroxyalkylaminoalkylamides and the process of making them by reacting alkyl and aryl nitriles with alkanolamines at about 100° to about 220°C. under anhydrous, non-catalytic conditions and at a mole ratio of alkanolamine per nitrile group exceeding 2 to 1.

3,714,250

N,N-DIETHYL (2-ALLYL-TERT-BUTYL SUBSTITUTED-PHENOXY) ACETAMIDES

Richard Rips, Paris, France, assignor to Institut National de la Sante et de la Recherche Medicale and Les Laboratoires Millot, both of Paris, France

No Drawing. Filed Dec. 29, 1969, Ser. No. 888,857

Claims priority, application France, Dec. 31, 1968, 182,835

Int. Cl. C07d *103/22*

U.S. Cl. 260—559 B **2 Claims**

Derivatives of mono- or ditertiary butyl phenols and of mono- and di-tertiary butyl o-alkyl phenols in which the phenolic hydrogen atom is substituted by an

$$NH_2—CO—O—$$

or $NH_2—CO—CH_2—O$ group or corresponding group wherein the amino hydrogen atoms are replaced by ethyl groups are described, together with processes for their manufacture. The compounds are chemotherapeutically valuable for their tranquillizing, hypnogenic, analgesic, psychotonic, antidepressant and anticonvulsant activity.

3,714,251

PROCESS FOR THE PRODUCTION OF OXAMIDE

Theodor Lussling and Ferdinand Theissen, Grossauheim, and Wolfgang Weigert, Offenbach am Main, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

No Drawing. Filed Apr. 8, 1970, Ser. No. 26,745

Claims priority, application Germany, Apr. 16, 1969, P 19 19 287.1

Int. Cl. C07c *103/08*

U.S. Cl. 260—561 K **18 Claims**

Oxamide is produced by the hydrolysis of cyanogen with water in the presence of hydrogen halide in an organic solvent such as sulfones, ketones, cyclic and acyclic ethers.

3,714,252

SUBSTITUTED ACID ANILIDES

Hans Kiefer, Wachenheim, and Adolf Fischer, Mutterstadt, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Oct. 26, 1970, Ser. No. 84,159

Claims priority, application Germany, Oct. 30, 1969, P 19 54 547.2

Int. Cl. C07c *103/32, 103/38*

U.S. Cl. 260—562 R **2 Claims**

New and valuable substituted acid anilides and a process for controlling the growth of unwanted plants with these compounds.

3,714,253

2-AMIDINOHYDRAZONO-GLYOXYANILIDE DERIVATIVES

James L. Diebold, Havertown, and Milton Wolf, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 19, 1970, Ser. No. 38,914

Int. Cl. C07c *103/30*

U.S. Cl. 260—562 N **11 Claims**

Disclosed are 2-amidinohydrazono-glyoxylanilide derivatives and the method of producing the same by reacting a glyoxanilide oxime and an aminoguanidine in the presence of a strong acid. The 2-amidinohydrazono-glyoxylanilides have pharmacological utility as antitubercular and antitrichomonal agents.

3,714,254

DIFLUOROAMINO COMPOUNDS

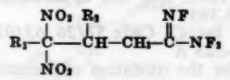
Clifford L. Coon, Fremont, Marion E. Hill, Palo Alto, and Donald L. Ross, Menlo Park, Calif., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Sept. 24, 1970, Ser. No. 75,308

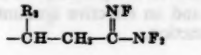
Int. Cl. C07c *87/22*

U.S. Cl. 260—564 R **7 Claims**

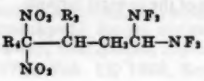
Compounds of the formulas



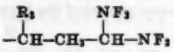
wherein R_1 is NO_2 or



R_2 and R_3 are H or lower alkyl of 1 to 4 carbon atoms and



wherein R_4 is



and R_2 and R_3 are H or lower alkyl of 1–4 carbons atoms, are useful as energetic plasticizers in rocket propellants.

3,714,255

ADDITION PRODUCTS OF NITROSYL HALIDES AND CYCLIC UNSATURATED HYDROCARBONS

Jerome Robert Olechowski, Trenton, N.J., assignor to Cities Service Company, New York, N.Y.

No Drawing. Filed Aug. 26, 1971, Ser. No. 175,332
Int. Cl. C07c *131/02, 81/00*
U.S. Cl. 260—566 A 3 Claims

Nitrosyl halides are reacted with unsaturated cyclic hydrocarbons to obtain halo, nitroso cyclic saturated or unsaturated hydrocarbons. In one embodiment chloronitrosotrimethylcyclododecadiene is prepared by reacting nitrosyl chloride with trimethylcyclododecatriene. The reaction milieu, if sufficiently acidic, catalyzes the conversion of the chloronitrosotrimethylcyclododecadiene to chlorooximinotrimethylcyclododecadiene. The chlorooximinotrimethylcyclododecadiene is useful in the production of ketones by acid hydrolysis to obtain fragrance materials or is converted to a lactam by a Beckmann rearrangement. The lactam is reacted to obtain a polyamide useful in the manufacture of fibers, such as nylon, or molded articles, such as containers and the like.

3,714,256

DIALLYL AND DIMETHALLYL ALKYL LIPOPHILIC BENZYL AMMONIUM HALIDES

Carlos M. Samour, Wellesley, and Mildred C. Richards, Wakefield, both of Mass., assignors to The Kendall Company, Walpole, Mass.

Filed May 26, 1970, Ser. No. 40,719
Int. Cl. C07c *87/02*
U.S. Cl. 260—567.6 M 3 Claims

Quaternary ammonium salts having a diallyl or dimethallyl radical and a lipophilic radical covalently linked to the quaternized nitrogen are disclosed. These quaternary ammonium salts are useful as monomeric emulsion stabilizers.

3,714,257

METHOD FOR PRODUCING DIALKYLATED DIARYLAMINES

Charles Edward Bayha, Monroe, N.Y., and Thomas Raymond Madden, Ringwood, N.J., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Jan. 21, 1970, Ser. No. 4,521
Int. Cl. C07c *87/54*
U.S. Cl. 260—576 5 Claims

A method of producing a solid dialkylated diarylamine suitable for use as an antioxidant for rubbery materials and other systems subject to degradation, comprising reacting (A) an olefin and (B) a diarylamine in the presence of a Friedel-Crafts catalyst under an inert high pressure atmosphere at a temperature of about 150° C. This method affords a high yield and reduces undesirable by-products.

3,714,258

DIALKYLATED DIARYLAMINES AND A METHOD FOR PRODUCING SAME

Charles Edward Bayha, Monroe, and Thomas Raymond Madden, Ringwood, both of N.J., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed Aug. 28, 1970, Ser. No. 67,891
Int. Cl. C07c *87/54*
U.S. Cl. 260—576 13 Claims

A solid dialkylated diarylamine useful as an antioxidant for rubbery materials and other systems subject to degradation and method of producing the same. The improved method of production consists of reacting (A) an olefin and (B) a diarylamine in the presence of a Friedel-Crafts catalyst under an inert atmosphere at ambient pressures and a temperature ranging from about 120°–140°C., said olefin being introduced below the surface of said diarylamine (B). This method affords a high yield and reduces undesirable by-products.

3,714,259

PRODUCTION OF LINEAR POLYETHYLENE POLYAMINES

Myrl Lichtenwalter, and Thomas Howard, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Aug. 20, 1970, Ser. No. 65,735
Int. Cl. C07c *85/06*
U.S. Cl. 260—583 P 9 Claims

A catalytic process is provided for discriminately producing linear polyethylene polyamines wherein linear products are obtained by reacting an ethyleneamine compound with an ethanolamine compound under select process conditions.

3,714,260

4,4-BIS (DIFLUORAMINO)-1,7-DIFLUORO-1,1,7,7-TETRANITROHEPTANE

Clifford L. Coon, Fremont; Marion E. Hill, Palo Alto, and Donald L. Ross, Menlo Park, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 13, 1969, Ser. No. 866,438
Int. Cl. C07c *87/22*
U.S. Cl. 260—583 NH 3 Claims

4,4-bis (difluoramino)-1,7-difluoro-1,1,7,7-tetranitroheptane, a plasticizer for double-base propellant systems, is synthesized by reacting 1,7-difluoro-1,1,7,7-tetranitro-4-heptanone with a mixture of fuming H_2SO_4, CH_2Cl_2 and HNF_2.

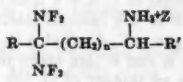
3,714,261

DIFLUOROAMINO COMPOUNDS

William H. Gilligan, and William E. McQuistion, both of Washington, D.C., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 26, 1967, Ser. No. 679,290
Int. Cl. C07c *87/22*
U.S. Cl. 260—583 NH 7 Claims

A high energy polyfluoroamino compound useful in propellant and explosive compositions and having the formula:



wherein R and R′ are hydrogen or alkyl, Z is Cl^-, ClO_4^- or NO_3^- is disclosed.

3,714,262

BICYCLIC POLYKETONE INTERMEDIATES

Gabriel Saucy, Essex Fells, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,136
Int. Cl. C07c *45/00*
U.S. Cl. 260—586 H 6 Claims

Bicyclic polyketones are obtained by oxidation of correspondingly substituted cyclopenta(f)(1) benzopyrans. In a preferred embodiment 3-(4-oxopentyl)-6aβ-methylperhydrocyclopenta(f)(1) benzopyran-4a,7-diol is oxidized with Jones reagent to yield 4-(3,7-dioxo-octyl)-7a-methylperhydroindan-1,5-dione. The bicyclic polyketones are useful as intermediates in the total synthesis of steroids of known medicinal value.

3,714,263

SELECTIVE OXIDATION OF ALKYL AROMATIC COMPOUNDS

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 604,651, Dec. 27, 1966. This application Oct. 29, 1969, Ser. No. 872,401
Int. Cl. C07c *49/76*
U.S. Cl. 260—592 9 Claims

Alkyl aromatic compounds are treated with an oxygen-containing gas at an elevated temperature and pressure in the presence of a liquid-water phase to selectively oxidize said compound to predetermined oxidation products and preferably, alcohols and aldehydes or ketones.

3,714,264

ALYLATION PRODUCT OF 4(METHYLTHIO) PHENOL

Ronald B. Spacht, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 664,602, Aug. 31, 1967, Pat. No. 3,553,163. This application Aug. 17, 1970, Ser. No. 64,641
Int. Cl. C07c *149/36*
U.S. Cl. 260—609 F 2 Claims

Alkylthio substituted mononuclear phenolic age resistors and age resistant polymers containing said age resisters.

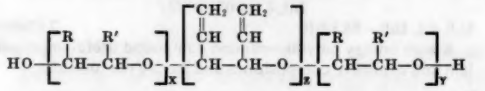
3,714,265

HYDROXY ALKYLENE ETHERS OF DIVINYL GLYCOL

Andre Bader, 150 avenue A. Maes, and Francis Weiss, 3 Chemin du Grand Perron, both of Pierre-Benite, France

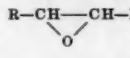
Continuation-in-part of Ser. No. 686,763, Nov. 29, 1967, abandoned. This application Jan. 9, 1970, Ser. No. 1,860
Int. Cl. C07c *43/14*
U.S. Cl. 260—611 B 1 Claim

A novel polyalkylene glycol has the general formula



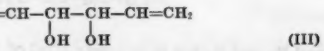
(I)

in which Z is an integer of 1, X + Y is an integer of from 1 to about 50 and R and R′ are radicals selected from the group consisting of hydrogen, a C_1–C_6alkyl, a C_2–C_6 alkenyl a C_2–C_6 alkynyl, and, when R and R′ are taken together, a C_3–C_6 alkylene. When X is an integer of O, the hydroxyl radical is linked directly to the carbon of unit Z of the formula and when Y is an integer of O, the hydrogen radical is linked directly to the oxygen of unit Z. It is preferred to have X and Y each being an integer of at least 1 and R and R′ be hydrogen or C_1–C_6 alkyl radicals or to represent, when taken together a C_3–C_6 alkylene radical. The polyalkylene glycols of this invention are produced by heating, in the presence of an alkaline catalyst, an epoxide of the general formula



(II)

in which R and R′ have the same meaning as stated hereinabove, with divinyl glycol of the formula



(III)

The epoxide is heated with the divinyl glycol at a temperature in the range from about 50° – 200° C. and the molar ratio of epoxide to divinyl glycol is between 1 and about 50.

3,714,266

PROCESS FOR POLYMERIZATION OF TETRAHYDROFURAN

Kazuo Matsuda, Wakayama, Yoshiaki Tanaka, Osaka, and Takeyo Sakai and Ichiro Iwasa, Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

No Drawing. Filed Mar. 10, 1970, Ser. No. 18,298
Claims priority, application Japan, Mar. 18, 1969, 44/20,665
Int. Cl. C07d *41/00, 43/00*
U.S. Cl. 260—615 B 6 Claims

Tetrahydrofuran is polymerized in the presence of a catalyst of (1) 8 to 40 percent by weight, based on the amount of tetrahydrofuran, of fuming sulfuric acid containing 15–43 wt. percent of SO_3, and (2) 0.05–20 percent by weight, based on the weight of fuming sulfuric acid, of perchloric acid. The reaction temperature is in the range of −40° C. to +100° C.

3,714,267

PROCESS FOR THE NITROSATION OF M-CRESOL

Roger A. Baldwin, Oklahoma City, Okla., and Ming T. Cheng, Buena Park, Calif., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed June 3, 1970, Ser. No. 43,232
Int. Cl. C07c *39/02*
U.S. Cl. 260—621 N 4 Claims

The invention provides a process for the nitrosation of m-cresol which includes the simultaneous addition of separate streams of a nitrosating agent and m-cresol to a quantity of a cold aqueous acid solution.

3,714,268

PROCESS FOR PRODUCING GRANULATED FREE-FLOWING 2,6-DITERTIARYBUTYL-4-METHYLPHENOL

Hiroshi Kaminaka, Toyonaka-shi; Takashi Tamura, Ibaraki-shi, and Kenji Tanimoto, Minoo-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 561,004, June 28, 1966, abandoned. This application Jan. 13, 1970, Ser. No. 2,673
Int. Cl. C07c *39/06*
U.S. Cl. 260—624 R 3 Claims

A process for granulating 2,6-ditertiarybutyl-4-methylphenol, which comprises recrystallizing 2,6-ditertiarybutyl-4-methylphenol from a mixture of water and at least one organic solvent of hexane, cyclohexane, heptane, octane, isooctane, petroleum ether, petroleum benzine and ligroin in the presence of an ethylene oxide adduct of nonylphenol, thereby obtaining a granular product having a better intergranular slidability, excellent flowability and lower static chargeability than the starting 2,6-ditertiarybutyl-4-methylphenol.

3,714,269

PROCESS FOR PRODUCING 2,6-DIMETHYLPHENOL

Ken Ito and Hiroshi Kaminaka, Toyonaka-shi, and Kunihisa Oie, Takarazuka-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Feb. 12, 1968, Ser. No. 704,529
Claims priority, application Japan, Feb. 15, 1967, 42/9,993
Int. Cl. C07c 37/12
U.S. Cl. 260—621 R 3 Claims

2,6-dimethylphenol is produced by reacting 4-tert.-butyl-2,6-dimethylphenol with phenol in the presence of sulfuric acid, toluene sulfonic acid, at a temperature of 120 to 180° C. for 0.5 to 6 hours, to effect a rearrangement of the tertiary butyl group from 4-tert.-butyl-2,6-dimethylphenol to phenol, and then rectifying the reaction product.

3,714,270

HYDRATION OF AMINES TO ALCOHOLS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed June 24, 1970, Ser. No. 49,504
Int. Cl. C07c 29/00
U.S. Cl. 260—632 R 14 Claims

A primary, secondary or tertiary amine is hydrated in a liquid reaction medium containing a ruthenium, osmium, rhenium, or technetium catalyst, preferably in complex association with a biphyllic ligand at a temperature of 50°–400° C, to form an alcohol. A typical process comprises reacting tributylamine with water in a liquid medium containing ruthenium trichloride and triphenylphosphine to produce butanol.

3,714,271

PRODUCTION OF POLYFLUOROPROPANOLS

Bernard M. Regan, Chicago, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Continuation-in-part of Ser. No. 787,575, Dec. 27, 1968, abandoned, which is a continuation-in-part of Ser. Nos. 667,065, Sept. 12, 1967, Pat. No. 3,431,313, and Ser. No. 663,952, Aug. 29, 1967, Pat. No. 3,499,089, said Ser. No. 667,065, Division of Ser. No. 538,523. This application July 27, 1970, Ser. No. 58,687
Int. Cl. C07c 31/34
U.S. Cl. 260—633 1 Claim

1,1,3,3-Tetrafluoropropan-2-ol and 1,1,1,3,3-pentafluoropropan-2-ol are prepared by the vapor phase catalytic halogen hydrogenolysis and carbonyl reduction of perhaloacetones with hydrogen employing a supported palladium on carbon catalyst.

3,714,272

NITRATION WITH NITRIC ACID AND TRIFLUOROMETHANESULFONIC ACID

Clifford L. Coon, Fremont, and Marion E. Hill, Palo Alto, Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

No Drawing. Filed Feb. 7, 1972, Ser. No. 224,275
Int. Cl. C07c 79/10, 79/12
U.S. Cl. 260—645 4 Claims

Two moles of trifluoromethanesulfonic acid combine with one mole of nitric acid to form a white crystalline solid having excellent nitrating capabilities when employed either in an organic solvent medium or in sulfuric acid or an excess of the trifluoromethanesulfonic acid. The nitration reaction can be conducted using one or another of these media at temperatures ranging from about —110° to 30° C., with any side reactions being substantially absent. The process is characterized by high positional selectivity, and when nitrating toluene to dinitrotoluene, total content of meta isomers can be kept at levels well below 1 percent by using an organic solvent and low temperatures. Yields exceed 98 percent.

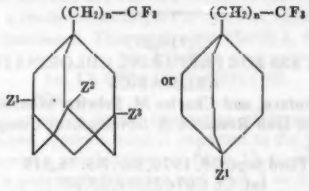
3,714,273

FLUORINE CONTAINING ADAMANTANES AND BICYCLO [2.2.2] OCTANES

Charles William Tullock, Landenberg, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 29, 1970, Ser. No. 76,587
Int. Cl. C07c 23/20, 17/22
U.S. Cl. 260—648 F 7 Claims

Compounds of the formulas



wherein $n = 0$ to 3 inclusive, and Z^1, Z^2 and Z^3 are each $-(CH_2)_n-CF_3$, saturated lower alkyl or hydrogen are useful as heat transfer fluids and as working fluids in Rankine cycle engines.

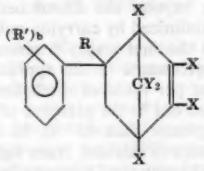
3,714,274

PROCESS FOR PREPARING BROMOPHENYL NORBORNENES

David S. Rosenberg, Niagara Falls, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed June 29, 1970, Ser. No. 51,010
Int. Cl. C07c 25/18
U.S. Cl. 260—649 R 12 Claims

Bromophenyl norbornenes are prepared by brominating a compound of the formula



with a mixture of bromine and chlorine in the presence of an antimony catalyst; wherein X is a halogen independently selected from the group consisting of fluorine, chlorine, bromine; Y is independently selected from the group consisting of fluorine, chlorine, bromine, alkyl of one to 10 carbon atoms, alkoxy of one to 10 carbon atoms, monohaloalkyl of one to 10 carbon atoms, wherein said halo is bromine, chlorine, or fluorine; R and R′ are independently selected from the group consisting of hydrogen and alkyl of one to six carbon atoms; $b = 0$ or 1. The resulting compounds are useful as fire retardant additives.

3,714,275

MONOCHLOROTETRAFLUOROBENZENE COMPOUNDS

Ogden R. Pierce, and John R. Greenwald, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 27, 1970, Ser. No. 67,616
Int. Cl. C07c 25/24
U.S. Cl. 260—650 F 1 Claim

3-Chloro-2,4,5,6-tetrafluoro-β-hydroxyethylbenzene is a precursor to 3-chlorotetrafluorostyrene which can be homopolymerized or copolymerized with styrene to obtain coating compositions.

3,714,276
DIFUNCTIONAL TETRAFLUOROBENZENE

Ogden R. Pierce, and John R. Greenwald, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 27, 1970, Ser. No. 67,619
Int. Cl. C07c 25/04
U.S. Cl. 260—650 F 1 Claim

2,4,5,6-tetrafluorobenzene compounds having β-hydroxyethyl, β-acetoxyethyl or vinyl difunctionality are disclosed. The β-hydroxyethyl and β-acetoxyethyl functional compounds are precursors to a divinyl-tetrafluorobenzene which can be reacted with SiH compounds to provide siloxanes having $SiCH_2CH_2C_6F_4CH_2CH_2Si$ linkages.

3,714,277
PROCESS FOR PREPARING CHLORINATED AROMATICS

Vincent A. Notaro, and Charles M. Selwitz, Monroeville, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 28, 1970, Ser. No. 76,319
Int. Cl. C07c 25/04, 25/18
U.S. Cl. 260—650 R 7 Claims

A process for preparing a chloro aromatic compound which involves heating an aromatic compound in the presence of a nitrate ion, a nitrite ion, NO or NO_2, HCl, water, oxygen, a strong acid and a 2,4,6-trialkylphenol.

3,714,278
PREPARATION OF BIS(DIBROMOETHYL) BENZENES

Howard M. Relles, Rexford, and Charles M. Orlando and Robert W. Schluenz, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Nov. 15, 1971, Ser. No. 199,000
Int. Cl. C07c 25/14
U.S. Cl. 260—651 R 7 Claims

In the bromination of ethylbenzenes, ring bromination and bromination beyond the dibromoethyl stage of the side chains are minimized by carrying out the bromination in two stages. In the first stage, bromine is reacted with the desired diethylbenzene in the approximate ratio of 2 moles of bromine per mole of diethylbenzene. The bromination is carried out in the presence of visible light at a temperature no greater than 45° C. In the second stage, the reaction mixture is shielded from light and is reacted with an additional amount of bromine in the approximate ratio of 2 moles of bromine for each mole of diethylbenzene initially used. This latter reaction is generally initiated at ambient temperature followed by heating to complete the reaction.

3,714,279
PROCESS FOR THE PRODUCTION OF 5-ALKYLIDENENORBORNENE-2

Hirosuke Imai, Yokohama, and Takeo Koizumi, Kawasaki-shi, both of Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan

Filed Nov. 4, 1971, Ser. No. 195,834
Claims priority, application Japan, Nov. 6, 1970, 45/97629
Int. Cl. C07c 5/28
U.S. Cl. 260—666 PY 7 Claims

A process is disclosed for the preparation of 5-alkylidenenorbornene-2 for use as an important component of EPDM rubber. This product is obtained by the isomerization of 5-alkenylnorbornene-2 which is carried out in the presence of a composite catalyst having increased activity and tending to suppress the formation of undesirable side products. The composite catalyst is essentially comprised of a cyclopentadienyl cobalt compound, an organometallic compound and an activating agent, and has been found peculiarly effective in the isomerization reaction.

3,714,280
CATALYTIC ALKYLATION OF AROMATIC COMPOUNDS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed June 9, 1971, Ser. No. 151,588
Int. Cl. C07c 15/16
U.S. Cl. 260—668 C 10 Claims

Esters of aliphatic or aromatic acids are reacted with an aromatic compound in the presence of BF_3 to yield diarylalkanes.

3,714,281
DEHYDROGENATION WITH A CATALYTIC COMPOSITE CONTAINING PLATINUM RHENIUM, A GROUP VI TRANSITION METAL AND AN ALKALI OR ALKALINE EARTH METAL

John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Application Jan. 12, 1970, Ser. No. 2,435, which is a continuation-in-part of abandoned application Ser. No. 723,895, Apr. 24, 1968. Divided and this application Dec. 13, 1971, Ser. No. 207,521
Int. Cl. C07c 5/18
U.S. Cl. 260—668 D 18 Claims

Dehydrogenatable hydrocarbons are dehydrogenated by contacting them at dehydrogenation conditions with a catalytic composite comprising a combination of catalytically effective amounts of a platinum group component, a rhenium component, a Group VI transition metal component and an alkali or alkaline earth metal component with a porous carrier material. A specific example of the catalytic composite disclosed herein is a combination of platinum, rhenium, tungsten and alkali or alkaline earth metal with a gamma-alumina carrier material in amounts sufficient to result in the composite containing, on an elemental basis, about 0.05 to 1 wt. percent platinum, about 0.05 to 1 wt. percent rhenium, about 0.01 to 1 wt. percent tungsten and about 0.1 to 5 wt. percent of the alkali or alkaline earth metal.

3,714,282
PRODUCTION OF PROPYLENE AND AROMATIC COMPOUNDS FROM LIQUID FEED STREAMS

Ronald O. Downs, St. Louis, Mo.; Robert M. Engelbrecht, deceased, late of St. Louis, Mo. (by Alice M. Engelbrecht, executrix); James C. Hill, Chesterfield, and Richard N. Moore, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed July 9, 1970, Ser. No. 53,692
Int. Cl. C07c 3/30
U.S. Cl. 260—673.5 10 Claims

Propylene and aromatic compounds are produced in significantly higher yields from liquid hydrocarbon feed streams by subjecting the feed stream to a low severity thermal cracking process. The effluent from the low severity thermal cracking process is separated into a stream comprising C_4 and lighter components and a stream containing the C_5 and heavier components. The stream containing the C_5 and heavier components is thereafter subjected to a thermal hydrocracking process.

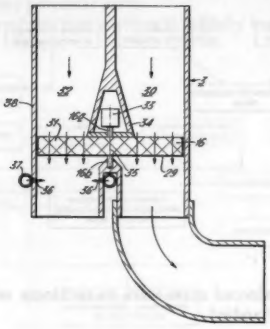
3,714,283
METHOD OF HEATING FLUIDS

Graham Rice, Reading, and James Francis Pollock, Henley, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 3, 1970, Ser. No. 60,405
Claims priority, application Great Britain, Aug. 6, 1969, 39,483/69
Int. Cl. B01j 7/00; C07c 5/22, 11/00; C09f 3/00
U.S. Cl. 260—675.5 4 Claims

A method for pyrolysis of chemical fluids in which the fluid to be pyrolysed is permeated through a porous heater

element to raise it to the required temperature. The product leaving the heater element is then rapidly cooled to



control the resident time that the fluid is at the pyrolysis temperature.

3,714,284

DIMERIZATION OF OLEFINIC COMPOUNDS

Ted Symon, Lombard, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 26, 1970, Ser. No. 84,209
Int. Cl. C07c *11/12*
U.S. Cl. 260—677 R 7 Claims

Olefinic compounds, and particularly conjugated diolefinic hydrocarbons, are dimerized in the presence of certain catalytic compositions of matter at dimerization conditions to produce dimers which possess certain specific configurations.

3,714,285

MANUFACTURE OF ISOPRENE

Herbert Mueller, Frankenthal; Wolfgang Koernig, Heidelberg, and Harald Koehl, Bobenheim-Roxheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed June 21, 1971, Ser. No. 155,242
Claims priority, application Germany, June 27, 1970, P 20 31 900.0
Int. Cl. C07c *1/24*
U.S. Cl. 260—681 3 Claims

Manufacture of isoprene by catalytic dehydration of 3-methyl-3-buten-1-ol in the presence of inorganic acids as catalysts at elevated temperatures, wherein 3-methyl-3-buten-1-ol is passed over a pumice-supported phosphoric acid catalyst.

3,714,286

PROPYLENE DIMERIZATION PROCESS

Guy Desgrandchamps, Luxembourg; Henri Hemmer, Billere, and Michel Haurie, Pau, all of France, assignors to Societe Anonyme dite: Societe Nationale des Petroles D'Aquitaine, Courbeuoie, France

Filed Jan. 13, 1970, Ser. No. 2,653
Claims priority, application France, Jan. 16, 1969, 6900607
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D 12 Claims

A process for the dimerisation and codimerisation of olefines, consists in maintaining the olefine or olefines in an inert solvent in contact with a catalyst system comprising a complex formed by a halide of a transition metal of Group VIII, complexed with 1 to 6 molecules, per atom of transition metal, of an organic sulphoxide or disulphoxide, the complex being accompanied by an organoaluminium compound.

The process can be carried into effect in accordance with two variants: EITHER THE CATALYST IS PREPARED IN SITU, WHICH REQUIRES AN Al/transition metal atomic ratio which is between 3 and 9 to 1, or the catalyst is prepared ex situ (continuous process), which requires an Al/transition metal ratio greater than 9 to 1.

3,714,287

SILICONE-ACRYLATE SOIL RELEASE TREATMENT FOR ORGANIC TEXTILES

James K. Campbell, Glamorgan, Wales, and Kenneth M. Lee, Bay City, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 85,702, Oct. 30, 1970, Pat. No. 3,677,810 which is a continuation-in-part of Ser. No. 69,467, Sept. 3, 1970, abandoned. This application March 1, 1972, Ser. No. 231,002
Int. Cl. C08g *37/32*; C08j *1/40*
U.S. Cl. 260—826 10 Claims

Removal of stains during laundering of organic textiles is facilitated and superior hand is imparted to the fabric by applying thereto a combination of from 10 to 99 percent by weight of a polymethylsiloxane and from 1 to 90 percent by weight of a polymeric, unsaturated, water-soluble carboxylic acid. This combination works especially well in combination with aminoplast crease resistance textile resins. A typical formulation is 45 percent by weight of dihydroxyl dimethylolethylene urea resin, 27.5 percent by weight of a polydimethylsiloxane of 50,000 cs. viscosity and 27.5 percent by weight of polymethacrylic acid.

3,714,288

VINYL RESIN - SILOXANE PAINT

John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 776,781, Nov. 18, 1968, Pat. No. 3,577,265. This application Dec. 17, 1970, Ser. No. 99,246
Int. Cl. C08f *35/02*
U.S. Cl. 260—827 14 Claims

A radiation-curable, film-forming paint binder is provided by mixing about 20 to about 80 parts by weight of (1) an alpha-beta olefinically unsaturated copolymer of vinyl monomers having molecular weight in the range of about 1,000 to about 25,000 and about 0.5 to about 5 units of alpha-beta olefinic unsaturation per 1,000 units molecular weight, and (2) an alpha-beta olefinically unsaturated siloxane containing about 3 to about 18 silicon atoms per molecule. The unsaturated siloxane is the reaction product of at least two molar parts of of a monomeric, monohydroxy ester of an alpha-beta olefinically unsaturated monocarbolylic acid, e.g., acrylates, methacrylates, crotonates, cinnamates, with one molar part of a siloxane wherein at least two silicon atoms have one valence satisfied by a hydroxyl group or an alkoxy group. Vinyl monomers may also be included in the paint dispersion.

3,714,289

THERMOPLASTIC POLYHYDROXY ETHERS MODIFIED WITH POLYAMIDES

Donald L. Schober, Belle Mead, James E. McGrath, Somerville, and Markus Matzner, Edison, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,196
Int. Cl. C08g *41/04, 45/12*
U.S. Cl. 260—830 P 14 Claims

Blends of thermoplastic polyhydroxyethers, derived from bisphenol A and epichlorohydrin, with polyamides were prepared having superior environmental stress crack resistance over that of the polyhydroxyethers alone. The resultant blends are mechanically compatible and can be molded and blown into film form.

3,714,290
CHEMICALLY CURABLE LIQUID POLYENE-POLYTHIOL POLYMER COMPOSITION

Clifton L. Kehr, Silver Spring, and Walter R. Wszolek, Sykesville, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Application June 23, 1970, Ser. No. 49,207, which is a continuation-in-part of abandoned application Ser. No. 617,801, Feb. 23, 1967, which in turn is a continuation-in-part of abandoned application Ser. No. 567,841, July 26, 1966. Divided and this application June 25, 1971, Ser. No. 156,968

Int. Cl. C08d *1/00*; C08f *1/16*; C08c *11/54*

U.S. Cl. 260—858 **14 Claims**

The invention disclosed is for a new chemically curable liquid polymer composition which includes a liquid polyene component having a molecule containing at least two unsaturated carbon-to-carbon bonds disposed at terminal positions on a main chain backbone of the molecule, and a polythiol component having a molecule containing a multiplicity of pendant or terminally positioned —SH functional groups per average molecule. The chemically curable liquid polymer composition upon curing in the presence of a chemical free radical generating reagent forms odorless, solid, elastomeric products which may serve as sealants, coatings, adhesives, and molded articles.

3,714,291
NOVEL POLYESTER RESINS CONTAINING SPIROACETAL UNITS

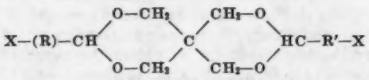
Kenneth William Rockey, Cookham, Berkshire, England, assignor to Albright & Wilson Limited, Oldbury, near Birmingham, Warwickshire, England

Filed Aug. 14, 1970, Ser. No. 63,937

Int. Cl. C08f *21/00*; C08g *17/10*

U.S. Cl. 260—861 **16 Claims**

The invention provides a cured polyester resin consisting of a co-polymer of at least one dicarboxylic acid and at least one dihydroxy alcohol wherein a part of the dicarboxylic acid and/or the dihydroxy alcohol is a compound of the formula:



wherein each of R,R′ is a divalent organic group and each X is a carboxyl group or acid forming derivative thereof or a hydroxyl group, the said polyester containing a proportion of ethylenically unsaturated linkages being cured by cross linking with an ethylenically unsaturated compound such as styrene.

3,714,292
CHEMICALLY THICKENED POLYESTER RESIN

Melvin E. Baum, Monroeville, Pa. and John A. Hatton, Jr., Madeira, Ohio, assignors to Koppers Company, Inc.

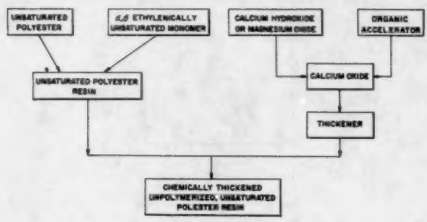
Division of Ser. No. 28,600, April 15, 1970, Pat. No. 3,637,911. This application Sept. 3, 1971, Ser. No. 177,596

Int. Cl. C08f *43/02*

U.S. Cl. 260—865 **5 Claims**

The viscosity of unsaturated polyester resins formed by mixing the condensation polymers of unsaturated dicarboxylic acids and dihydric alcohols in ethylenically unsaturated copolymerizable monomers may be greatly increased by adding (1) a mixture of calcium oxide and either calcium hydroxide or magnesium oxide, and (2) an organic acid selected from the group consisting of benzoic acid, cyclohexane carboxylic acid, cinnamic acid and p-hydroxybenzoic acid to the unsaturated polyester resins.

The viscosity of the composition is initially low enough so that fibrous reinforcements can be impregnated with the resin composition and the low viscosity permits the resin to wet the fibers, thereafter the viscosity of the resin increases and the



fibrous reinforced mass loses its tackiness and can be easily stored and handled.

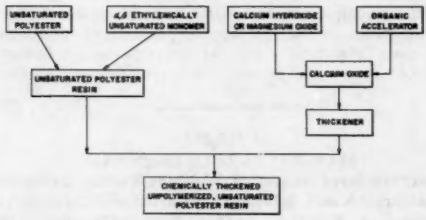
3,714,293
CHEMICALLY THICKENED POLYESTER RESIN

Melvin E. Baum, Monroeville, Pa., and John A. Hatton, Jr., Madeira, Ohio, assignors to Koppers Company, Inc.

Division of Ser. No. 28,600, April 15, 1970, Pat. No. 3,637,911. This application Sept. 3, 1971, Ser. No. 177,779

Int. Cl. C08f *43/02*

U.S. Cl. 260—865 **5 Claims**



The viscosity of unsaturated polyester resins formed by mixing the condensation polymers of unsaturated dicarboxylic acids and dihydric alcohols in ethylenically unsaturated copolymerizable monomers may be greatly increased by adding (1) a mixture of calcium oxide and either calcium hydroxide or magnesium oxide, and (2) an organic acid selected from the group consisting of benzoic acid, cyclohexane carboxylic acid, cinnamic acid and p-hydroxybenzoic acid to the unsaturated polyester resins.

The viscosity of the composition is initially low enough so that fibrous reinforcements can be impregnated with the resin composition and the low viscosity permits the resin to wet the fibers, thereafter the viscosity of the resin increases and the fibrous reinforced mass loses its tackiness and can be easily stored and handled.

3,714,294
CHEMICALLY THICKENED POLYESTER RESIN

Melvin E. Baum, Monroeville, Pa. and John A. Hatton, Jr., Madeira, Ohio, assignors to Koppers Company, Inc.

Division of Ser. No. 28,600, April 15, 1970, Pat. No. 3,637,911. This application Sept. 3, 1971, Ser. No. 177,780

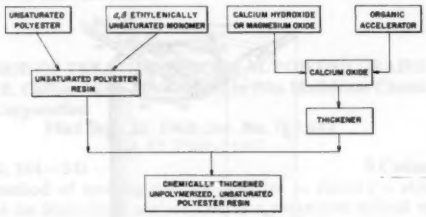
Int. Cl. C08f *43/02*

U.S. Cl. 260—865 **5 Claims**

The viscosity of unsaturated polyester resins formed by mixing the condensation polymers of unsaturated dicarboxylic acids and dihydric alcohols in ethylenically unsaturated copolymerizable monomers may be greatly increased by adding (1) a mixture of calcium oxide and either calcium

hydroxide or magnesium oxide, and (2) an organic acid selected from the group consisting of benzoic acid, cyclohexane carboxylic acid, cinnamic acid and p-hydroxybenzoic acid to the unsaturated polyester resins.

The viscosity of the composition is initially low enough so



that fibrous reinforcements can be impregnated with the resin composition and the low viscosity permits the resin to wet the fibers, thereafter the viscosity of the resin increases and the fibrous reinforced mass loses its tackiness and can be easily stored and handled.

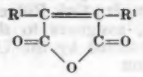
3,714,295

PROCESS FOR PREPARING GRAFT-COPOLYMERS

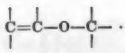
Yasuharu Nakayama, Kanagawa-ken, Japan, assignor to Kansai Paint Company Limited, Amagasaki-shi, Japan

Filed Feb. 2, 1971, Ser. No. 112,091
Claims priority, application Japan, Feb. 7, 1970, 45/11020
Int. Cl. C08f *15/00, 19/00, 15/10*
U.S. Cl. 260—879 **11 Claims**

A process for manufacturing a graft-copolymer comprises copolymerizing (a) a hydrocarbon polymer having carbon-carbon double bonds in the molecule with (b) a maleic anhydride compound represented by the formula of



wherein R^1 is hydrogen atom, halogen atom or methyl group and (c) a compound having in the molecule a vinyl ether group of the formula of



The present copolymer is useful as paint, adhesives, etc.

3,714,296

POLYCHLOROPRENE ELASTOMER

Chojiro Kitagawa; Ichiro Fukuoka, both of Tokyo; Takashi Kadowaki, Nishi Kubiki-gun, Niigata; Shoji Kimura; Takehiko Nishimura, both of Tokyo, and Kanehisa Hanabusa, Nishi-Kubiki-gun, Niigata, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1968, Ser. No. 753,765
Int. Cl. C08f *29/12*
U.S. Cl. 260—890 **7 Claims**

A polychloroprene elastomer prepared by blending a toluene insoluble gel polymer, obtained by polymerizing chloroprene or a mixture of chloroprene with at least one copolymerizable monomer, with a toluene soluble sol polymer obtained by polymerizing chloroprene or a mixture of chloroprene with at least one copolymerizable monomer, wherein the cross-linking density of the elastomer is at least 2.4×10^{-6}.

3,714,297

HYDROXY HALOGENATED ELASTOMERS RESISTANT TO OILS

Jean Blaise, Lyon, and Edouard Grimaud, Oullins, both of France, assignors to Ugine Kuhlmann, Paris, France

Continuation-in-part of Ser. No. 675,319, Oct. 6, 1967, abandoned. This application March 24, 1970, Ser. No. 22,375
Int. Cl. C08f *27/02, 27/06, 27/08*
U.S. Cl. 260—890 **3 Claims**

Novel hydroxyhalogenated elastomers are produced by first partially epoxidizing a high molecular diene elastomer in a solvent medium and then reacting the partially epoxidized product with a hydrohalogen acid in a solvent medium. Diene elastomers such as polymer and copolymers of butadiene, isoprene, dimethyl-2,3-butadiene, chloroprene, cyanobutadienes and piperylene are first epoxidized and then reacted with hydrohalogenated acids such as hydrochloric, hydrobromic, hydriodic and mixtures thereof. The hydroxyhalogenated elastomers thus produced can be vulcanized by an extremely broad range of vulcanization agents and covulcanized with many other elastomers. The vulcanizates of these elastomers are characterized by such properties as very good resistance to aromatic and aliphatic solvents and oils, excellent stability at high or low temperatures and low moisture absorption.

3,714,298

POLYBLEND OF ETHYLENE/VINYL CHLORIDE/ACRYLAMIDE INTERPOLYMER AND POLYACRYLAMIDE

Joseph G. Bergomi, Jr., St. Louis, Mo., assignor to Monsanto & Company, St. Louis, Mo.

Filed Jan. 5, 1971, Ser. No. 104,146
Int. Cl. C08f *27/18*
U.S. Cl. 260—897 C **9 Claims**

Composition comprising a polyblend of ethylene/vinyl chloride/acrylamide interpolymer and polyacrylamide useful as adhesive binder in inorganic paper coating compositions.

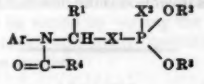
3,714,299

PHOSPHORYLATED ANILIDES

John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Feb. 20, 1970, Ser. No. 13,173
Int. Cl. C07f *9/08;* A01n *9/36*
U.S. Cl. 260—926 **15 Claims**

Insecticidal compounds of the formula



wherein Ar, R^1, R^2, R^3, R^4, X^1 and X^2 are as defined hereinafter.

3,714,300

BIS-(HINDERED PHENOL)-ALKYLENE DIPHOSPHONATES AND PHOSPHONOACETATES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed May 19, 1969, Ser. No. 825,953
Int. Cl. C07f *9/40;* C08f *45/98*
U.S. Cl. 260—932 **9 Claims**

Bis-(hindered phenol)-alkylene diphosphonates and phosphonoacetates prepared by hydroxyaryl alkylation

procedures, are stabilizers of organic material subject to oxidative deterioration.

3,714,301

ORGANIC THIOPHOSPHATES OF IMPROVED ODOR CHARACTERISTICS AND PROCESS FOR THEIR PRODUCTION

Morten Thomsen, 7620 Lemvig, Denmark, assignor to A/S Cheminora, Lemvig, Denmark

Filed Dec. 16, 1969, Ser. No. 885,617
Claims priority, application Denmark, Dec. 23, 1968, 6336
Int. Cl. C07f 9/08
U.S. Cl. 260—942 19 Claims

Removal from or/and inhibition of development of bad odor in, organic thiophosphate products, such as O,O-dimethyl-S-(1,2-carbethoxy ethyl)-dithiophosphate products. The desired result is obtained by treating the thiophosphate product with a small amount of a nitrogen oxide, preferably dinitrogen tetraoxide (nitrogen dioxide) or dinitrogen trioxide, or an inorganic or organic nitrite, such as ethyl nitrite or isoamyl nitrite.

3,714,302

PREPARATION OF NEOALKYL PHENYL PHOSPHITE

James L. Dever, Lewiston, and James John Hodan, Williamsville, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 510,076, Nov. 26, 1965, now Patent No. 3,467,733, dated Sept. 7, 1969. This application July 8, 1969, Ser. No. 840,016
Int. Cl. C07d 105/04
U.S. Cl. 260—976 9 Claims

Cyclic phosphites, such as phenyl neopentyl phosphite are produced by reacting phenol in the melt with a crude reaction product of PCl_3 and a 2,2-di-lower alkyl-1,3-propane glycol and recovering the desired product by distillation. The cyclic phosphites are useful as stabilizers for organic compositions such as rubber and polyvinyl chloride.

3,714,303

DEODORIZATION OF PHOSPHORODITHIOATES

Lowell R. Smith, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 3, 1971, Ser. No. 139,855
Int. Cl. C07f 9/16
U.S. Cl. 260—989 5 Claims

Malodorous phosphorodithioate compounds are deodorized by contacting said compounds with zinc oxide. Representative of the class of compounds deodorized in accordance with this invention is the insecticide malathion.

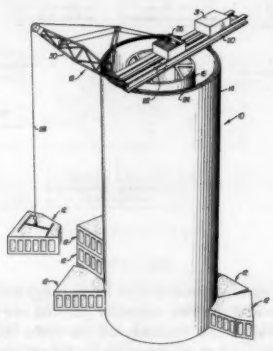
3,714,304

BUILDING CONSTRUCTION

John W. Carner, Rolling Hills, and Frank B. Anderson, El Segundo, Calif., assignors to Frank B. Anderson, El Segundo, and Earl E. Shaw, San Pedro, Calif.

Filed Dec. 29, 1969, Ser. No. 888,762
Int. Cl. B28b 7/12, 7/22, 7/30
U.S. Cl. 264—94 30 Claims

A modular building construction system of three interrelated phases: (1) a new method for precasting monolithic concrete building modules utilizing a plurality of essentially solid or uninterrupted internal mold members which shift vertically relative to the cast structure for release; (2) a new resulting precast monolithic building module provided by said method of high strength-to-weight ratio comprising ceiling structure with integral depending wall structure that is open at the bottom, the wall structure including both external and internal walls arranged in any desired horizontal-sectional wall plan not restricted by the casting method; and (3) a multi-story



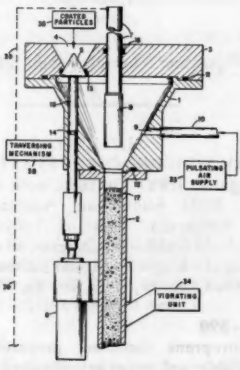
building comprising a plurality of these precast modules provided by said method in stacked relationship with the ceiling structure of each but the uppermost module serving as the floor of the next module above, the monolithic relationship between the ceiling-floor structures and both external and internal walls providing a total cellular construction wherein substantially all parts of the building contribute to its structural strength.

3,714,305

FABRICATION OF BONDED-PARTICLE NUCLEAR FUEL STICKS

Francis C. Davis, Oak Ridge, Donald D. Cannon, Powell, Francis J. Furman, Jr., Oak Ridge, and John D. Sease, Knoxville, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 10, 1971, Ser. No. 122,875
Int. Cl. C21c 21/04, 21/14
U.S. Cl. 264—.5 4 Claims



Fuel particles are vibratorily loaded into a given mold volume having a length and cross section corresponding

to the final fuel stick dimensions. This compacted body of particles is moved past a bonding mixture injection zone through the coordinated movement of upper and lower rams, together with an internally applied pulsating pneumatic pressure to prevent further bed compaction, for the gradual impregnation of the particle bed with the bonding mixture. Solidification of the bonding mixture occurs very soon after injection so as to provide strength to the fuel sticks.

3,714,306

METHOD OF TREATING SPHERICAL POWDER GRAINS

Ralph E. Coffee, Alton, Ill., assignor to Olin Mathieson Chemical Corporation

Filed Sept. 25, 1968, Ser. No. 762,641
Int. Cl. C06b *21/02*
U.S. Cl. 264—3 D **9 Claims**

A method of treating powder granules to remove a skin present on their outer surface due to a protective colloid of animal origin, said method comprising suspending the powder granules in a mixture of an aqueous solution and a proteolytic enzymes, and agitating the suspension until the skin is removed.

3,714,307

AQUEOUS COAGULATION OF SALT CONTAINING POLYURETHANE TO FORM POROUS SHEET

Tatsunori Shikada, Miyakojima-ku, Osaka, Japan, assignor to Kanegafuchi Boseki Kabushiki Kaisha

Continuation of Ser. No. 728,058, May 9, 1968, abandoned. This application Feb. 24, 1971, Ser. No. 118,530
Int. Cl. B29d *27/04*
U.S. Cl. 264—49 **4 Claims**

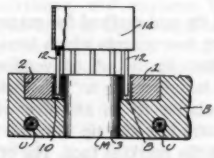
The process for producing a porous sheet material comprises the steps of applying a coating solution to at least one surface of a fibrous base or a film-making plate to form a coating layer. The coating layer is then coagulated and regenerated. The coating solution contains a water-miscible organic solvent, a polyurethane polyester and at least one inorganic salt. The aqueous medium comprises an aqueous solution of said inorganic salt in a concentration of below about two thirds its concentration at saturation and at least sufficient to yield a porous sheet. The coating solution comprises 10 to 50 parts by weight of inorganic salt in 100 parts by weight of a film forming polyester type polyurethane.

3,714,308

METHOD OF MAKING A PRINTING SLEEVE HAVING PRINTING CHARACTERS AROUND ITS PERIPHERY

Raphael D. Nettesheim, New Berlin, Wis., assignor to The Schwaab Label Company, Inc., Milwaukee, Wis.

Filed Aug. 18, 1969, Ser. No. 850,859
Int. Cl. B29d *3/02*; B41j *27/20*
U.S. Cl. 264—45 **11 Claims**



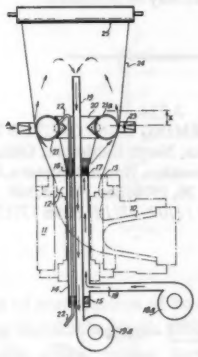
The method of molding printing characters from synthetic resin material and around the periphery of an endless belt or sleeve member. The method includes setting the sleeve within a circle formed by various printing characters, the sleeve being spaced from the characters so as to form an annular space therebetween. Synthetic resin material is then poured into the annular space so as to adhere to the sleeve and fill the mold cavities. The material is then cured by heating it and then is cooled to become hard. The resulting sleeve with printing characters formed around its periphery is then removed from the mold.

3,714,309

MANUFACTURE OF PLASTIC FILM

Bernard Keith Biglano, Radcliffe, Lancashire, England, assignor to General Engineering Co., Ltd.

Continuation of Ser. No. 738,008, June 18, 1968. This application Aug. 11, 1970, Ser. No. 63,019
Int. Cl. B29c *17/04*, *25/00*; B29d *7/24*
U.S. Cl. 264—89 **15 Claims**



A method of forming an extruded tube of plastic material comprising extruding the material in a semimolten state as a tubular film, having a wall of greater thickness than that of the finished tube, locating a former within the tube near the extrusion point, passing the film over the face of the former in close proximity thereto, at least part of the freeze zone of the film being between the plane of the maximum diameter of the former and the downstream end thereof, directing a high velocity stream of air against the inner face of said film at said former at a velocity at least as high as the point of resonance at said freeze zone to provide a skin sufficient to prevent actual contact between the film and former. The diameter of the tube being extruded can be varied by varying the diameter of the former. In order to obtain still greater speeds of extrusion, external cooling can be applied.

3,714,310

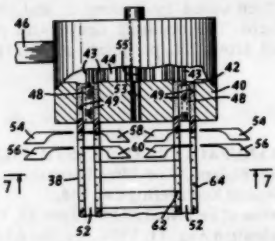
METHOD FOR MAKING RETICULATED TUBULAR NET

Bernard J. Gaffney, and Robert Lee Gaffney, Stillwater, Mich., assignors to Conwed Corporation

Continuation-in-part of Ser. No. 51,060, June 30, 1972, abandoned. This application Oct. 30, 1970, Ser. No. 85,324
Int. Cl. B26d *3/16*; B29c *17/14*; B29d *23/04*
U.S. Cl. 264—89 **5 Claims**

A tube is extruded through a die and then partially severed on each side as the extruded item is moved away from the die. The cuts made on one side may be vertically spaced from the

cuts made on the other side of the tube or sheet. The partially severed product is then unfolded to produce a thinner tube than that originally extruded. To produce a net structure, the die extrusion orifice is partially obstructed at a plurality of points to extrude a tube having continuous axial openings or



bores contained within its wall. The tube may then be cut and unfolded to form a net structure having openings therein which correspond to the shape of the obstruction placed in the orifice or depending upon the way in which the cutting is carried out a double wall met may be produced.

3,714,311

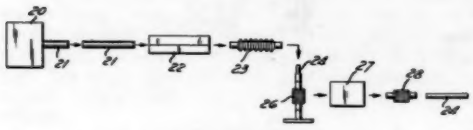
METHOD FOR FORMING CONVOLUTED TUBING

Joseph Anthony Stefanka, North Baltimore, Ohio, assignor to Norbalt Rubber Corporation, North Baltimore, Ohio

Filed Aug. 20, 1970, Ser. No. 65,368

Int. Cl. B29c *17/07, 17/14;* **B29h** *17/15*

U.S. Cl. 264—98 **5 Claims**



A method for forming corrugated tubing. Uncured elastomeric material is extruded to form cylindrical tubing. This tubing is pressurized without curing in a separable mold causing it to plastically deform to an intermediate shape in which the tube has shallow corrugations each having a length exceeding the desired corrugation length. The tube is subsequently positioned on a mandrel and axially shortened causing the initial corrugations to plastically deform to the desired final shape in which the corrugation walls are substantially radial and the length of each corrugation approaches a length equal to the sum of the thicknesses of the corrugation walls. The material is cured while on the mandrel to complete the manufacturing operation.

3,714,312

METHOD OF PRODUCING REINFORCED PIPE

Haruo Nitta, and Naotoshi Sagawa, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1970, Ser. No. 62,936

Claims priority, application Japan, Aug. 11, 1969, 44/63101

Int. Cl. B29c *5/04;* **B29d** *3/02*

U.S. Cl. 264—108 **6 Claims**

The invention relates to a method of manufacturing reinforced pipes, particularly those having a strong resistivity against internal pressure as well as compressive strength due to external crushing forces, made of a material obtained by mixing thermoplastic synthetic resin powder and a fibrous inorganic substance. The material is introduced in a rotatable

metal mold in a predetermined quantity, and the metal mold is heated externally while it is rotating. The fibrous substance is diffused uniformly in the molten plastic material and aligned in the peripheral direction, and thus the reinforced pipe is produced.

3,714,313

AGGLOMERATING PARTIALLY DEHYDRATED GEL-DERIVED PSEUDOBOEHMITIC ALUMINA TO FORM STRONG POROUS SPHERES

William A. Beiding; Robert B. Emerson, and Raymond L. Williams, all of Baton Rouge, La., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jan. 27, 1971, Ser. No. 110,318

Int. Cl. B01j *11/44;* **C01f** *7/02*

U.S. Cl. 264—117 **5 Claims**

Gel-derived crystalline alumina containing at least 40 percent pseudoboehmite and having low cationic and anionic impurity levels is partially dehyrated to an LOI of 22–34 percent, ground to at least 85 percent minus 325 mesh, shaped into spheres by conventional agglomerating devices while adding sufficient water to rise the total water content to 52–65 percent. These shaped spheres, without any ageing treatment, are then heated to a temperature in the range of 350°–650°C for a time necessary to produce the desired strength. The resultant spheres are strong and have a high total porosity, at least 20 percent of which consists of pores in the 120–800 A size range. They are useful as desiccants, active alumina and catalyst supports.

3,714,314

METHOD FOR MANUFACTURING POROUS POINT TIP

Henry Davidson, Huntington Beach, Calif., assignor to The Gillette Company, Santa Monica, Calif.

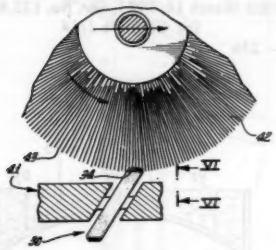
Filed Mar. 22, 1971, Ser. No. 126,827

Int. Cl. B29c *17/12;* **B29d** *27/00*

U.S. Cl. 264—137 **5 Claims**

A porous point tip and method for manufacturing same for use in marking instruments which have a soft, velvety brush-like feel when in use. A conventionally manufactured marker tip is subject to a "velvetizing" process by moving the tip relative to an abrasive wheel such as a wire brush and intruding the tip into the brush so as to abrade or roughen the marking face. The present invention is particularly adapted to produce tips which have a broad coherent liquid conveying body and an integral soft terminal or end portion rather than the hard pointed tip of conventional writing instruments which produce a fine line trace. In a particular application of the invention, the

tip is comprised of one or more slivers of synthetic staple fibers bonded into a porous rod which is subsequently severed to provide a terminal marking face which is then brought into engagement with the peripheral edge portion of the rotating abrasive wheel to fracture the bond between most of the fibers or filaments adjacent the marking face to a depth of from 20 to 50 mils without destroying the integrity of the filaments and without softening the individual filaments to the point at which they become fusible with contiguous filaments so as to produce a marking face which has a plurality of unbonded filament end portions capable of independent bending while the body of the tip retains its bending strength.



3,714,315
METHOD OF PRODUCING SHAPED ELASTOMER STRUCTURE

Robert G. Minton, and Sidney Melamed, both of Elkins Park, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 655,707, June 14, 1967, Pat. No. 3,673,280, which is a continuation-in-part of Ser. No. 372,476, June 4, 1964, abandoned. This application Aug. 5, 1970, Ser. No. 61,392

Int. Cl. D01d *5/12*; **B29c** *25/00*

U.S. Cl. 264—210 F **18 Claims**

Methods of producing shaped, elastomeric structures comprising: preparing, extruding, coagulating, drying and curing a latex of:

A. About 50–90 percent by weight of a base elastomeric composition as a "backbone" or main component formed by copolymerizing a mixture comprising

1. about 75–99.9 percent by weight of the base composition of at least one monomer polymerizable to give a rubbery polymer and selected from the group consisting of alkyl (C_2-C_8) acrylates, and mixtures thereof with each other and with up to an equal weight amount of ethylene, propylene, or isobutylene; and
2. at least about 0.1 percent by weight of the base composition of at least one ethylenically unsaturated monomer copolymerizable with (A)(1) and containing at least one radical effective to crosslink said base composition by a reaction which is activated separately from the polymerization reaction; and

B. About 50–10 percent by weight of a reinforcing material for the base composition and dispersed throughout the base composition consisting of a polymer of

1. at least one halogen monomer selected from the group consisting of vinylidene chloride, vinylidene fluoride, vinylidene fluorochloride, vinyl chloride and vinyl fluoride; and
2. up to about 6 percent by weight of the mixture of at least one α,β-monoethylenically unsaturated monomer copolymerizable with (B)(1).

The backbone is crosslinked by virtue of the reaction of the radicals in monomer (A)(2) to make the backbone solvent insoluble. The backbone may optionally contain a diluent and/or a hardener, the latter being a monomer effective to raise the glass transition temperature of the copolymer.

3,714,316
METHOD OF MANUFACTURE OF BOW STRING

Charles J. Angeloff, 7669 Chillicothe Road, Mentor, Ohio 44060

Filed Nov. 6, 1970, Ser. No. 87,422

Int. Cl. B29c *27/20*

U.S. Cl. 264—230 **6 Claims**

A method of manufacture of bow string for an archery bow utilizing shrinkable plastic tubing such as for instance heat shrinkable plastic tubing, for forming the loops on the ends of the bow string, for coaction with the ends of the bow in the propelling of an arrow. The purpose is to provide an arrangement for the expeditious forming of such loop portions and securement of the free ends of the strand material of the bow string to the latter. Applicant's arrangement obviates the heretofore utilized method of wrapping the base of each end loop of the bow string with encircling reinforcing cord. The use of shrinkable tubing materially expedites the formation of the bow string and makes a much more economically desirable bow string arrangement.

3,714,317
CONTINUOUS CURING PROCESS

Hugh L. Folkes, Sussex, England, assignor to Dunlop Holdings Limited, London, England

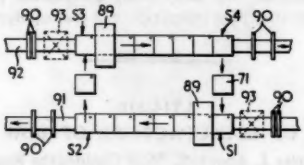
Continuation-in-part of Ser. Nos. 775,347, Nov. 13, 1968, abandoned, and Ser. No. 28,290, April 22, 1970, abandoned, which is a continuation of Ser. No. 592,131, Nov. 4, 1966, abandoned. This application June 12, 1970, Ser. No. 45,604

Int. Cl. B29d *29/00*; **B29h** *7/22*

U.S. Cl. 264—231 **6 Claims**

A method of heating and compressing an elongated article is provided. The invention comprises the use of a plurality of

individual press units which are heated; the press units are moved into heating and compression relationship with opposed surfaces of the article; each press unit is moved successively into engagement with the article and into contacting end to end relationship with the previous press unit, the units being moved relative to the surface only in a direction perpendicular to the surfaces when in contact with the surfaces; the press units and the article are moved stepwise in the direction of the length of the article; the press units are continuously maintained in contact with the article until the end of the heating and compressing cycle; with the press unit finally successively being moved out of engagement with the thus produced elongated article.



3,714,318

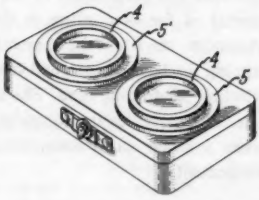
METHOD OF MAKING A SEALING GASKET

Francis J. Charewicz, Lanesboro, Eugene K. Steele, Dalton, and Frank S. Nichols, Pittsfield, Mass., assignors to General Electric Company

Original application Oct. 7, 1968, Ser. No. 765,288, now Patent No. 3,558,145. Divided and this application Sept. 25, 1970, Ser. No. 75,780

Int. Cl. B29c *25/00*; B44d *5/00*

U.S. Cl. 264—236 **3 Claims**



A compound gasket formed of a single piece of resilient material is provided with a resilient inner core and softer, more plastic, surface areas. The plastic surface areas of the gasket are adapted to flow readily into and around depressions and irregularities on surfaces of a lightning arrester and assembly when mounted thereon to provide a fluid-tight seal for the assembly; while the more resilient inner-core portion of the gasket is adapted to retain its resilience during the long life span demanded of lightning arrester sealing gaskets. In a preferred embodiment of the invention, the sealing gasket is formed by a reversion process in which predetermined portions of the surface of the gasket are subjected to a controlled temperature after the gasket is cured, thereby causing these surface portions to revert, or become partially uncured, and thus, change to a softer state than the inner resilient core of the gasket.

3,714,319

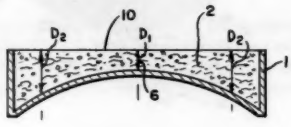
PROCESS FOR MAKING SEMI-METALLIC ARCUATE BRAKE LINING SEGMENTS

John P. Kwolek, Latham, N.Y., assignor to The Bendix Corporation

Filed March 10, 1971, Ser. No. 122,845

Int. Cl. B29b *1/14*

U.S. Cl. 264—236 **1 Claim**



A process for making semi-metallic arcuate brake lining segments from graphite, metal powder, fibrous materials (asbestos and steel wool) and a phenolformaldehyde resin binder, by placing the materials in a specially designed pan and then heating the materials to a temperature between the cure and flow temperature of the resin before die pressing and curing the material to a predetermined arcuate configuration.

3,714,320

COLD EXTRUSION PROCESS

Robert B. Shaw, Orinda, Calif., assignor to Shell Oil Company, New York, N.Y.

application Sept. 30, 1968, Ser. No. 798,490

Int. Cl. B28b *3/20*

U.S. Cl. 264—323 **1 Claim**

Polypropylene articles of high impact resistance at low temperatures and of improved tensile properties which permit their use at substantially higher tensile loads than conventionally produced articles of polypropylene, are produced by deforming the polypropylene in the solid state under compressive stress. A form of polypropylene is disclosed which is characterized by absence of inhomogeneous deformation under tension, absence of whitening under tension until strained beyond 150 percent deformation, ductility at temperatures of 0°C and below, and an apparent glass transition temperature, determined by torsional damping at 1 cycle per second, of about 15°C.

3,714,321

METHOD FOR WITHDRAWAL OF CURED TIRES FROM A PRESS FOR SHAPING AND CURING TIRES

Shoushi Yoshida; Atsuaki Iwama; Takashi Odada, and Tetsuo Suda, all of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Oct. 5, 1970, Ser. No. 78,020

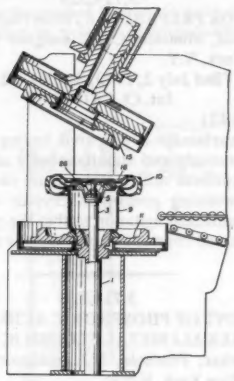
Claims priority, application Japan, Oct. 2, 1970, 44/80070

Int. Cl. B29c *7/00*; B29h *5/08*

U.S. Cl. 264—334 **4 Claims**

A method for removing a cured tire from a press for shaping and curing tires having upper and lower mold sections and a collapsible bladder having upper and lower beads. The upper

bead of the cured tire and the upper bead of the bladder are spaced and a plurality of segment plates are expanded into the space between the upper bead of the cured tire and the upper



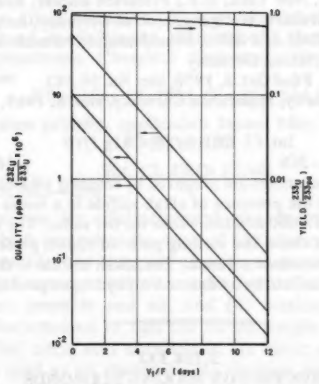
bead of the bladder. The segment plates are then moved upwardly while engaging the upper bead of the cured tire to strip the cured tire from the mold and the bladder.

3,714,322

METHOD FOR PREPARING HIGH PURITY 233 URANIUM

Michael J. Bell, and Marvin E. Whatley, both of Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed June 10, 1970, Ser. No. 45,086
Int. Cl. C01g *43/06*
U.S. Cl. 423—5 **2 Claims**



A method for preparing high purity ^{233}uranium is provided by processing molten salt reactor fuels containing protactinium isotopes in a series of at least two hold-up tanks wherein in the first tank, decay of ^{232}protactinium to ^{232}uranium is permitted to a preselected value and the ^{232}uranium is removed by subsequent fluorination. In the second tank, decay of ^{233}protactinium to ^{233}uranium is permitted to a preselected value and the ^{233}uranium, which is highly depleted in ^{232}uranium, is recovered by subsequent fluorination.

3,714,323

METHOD OF REMOVING CARBON FROM NUCLEAR FUEL ELEMENTS IN A CLOSED SYSTEM

Gioacchino Dolci, Pisa, and Ruggero Renzoni, Milan, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed Jan. 26, 1970, Ser. No. 5,769
Claims priority, application Italy, Jan. 21, 1969, 11,765/69
Int. Cl. C22b *61/04*
U.S. Cl. 423—4 **6 Claims**

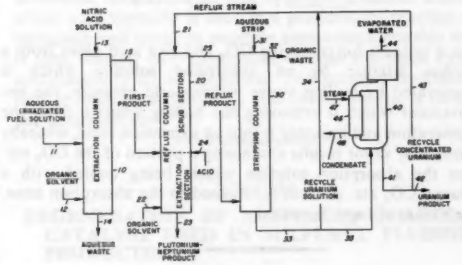
Methods are disclosed for eliminating carbon from nuclear fuel elements in the reprocessing thereof in a closed system. In one embodiment, the carbon is reacted with carbon dioxide to form carbon monoxide in an attack zone which is maintained at a temperature of about 1000° C., the carbon monoxide is then caused to flow to a regeneration zone which is maintained at a lower temperature so that a reverse reaction occurs which converts the carbon monoxide into carbon dioxide and regenerated carbon, the carbon dioxide flows back to the attack zone leaving the regenerated carbon behind in the regeneration zone.

3,714,324

IRRADIATED FUEL RECOVERY SYSTEM

Marx E. Weech, Pico Rivera, Calif., assignor to General Electric Company

Filed June 18, 1968, Ser. No. 738,009
Int. Cl. B01d *11/00*
U.S. Cl. 23—341 **8 Claims**



An improved process for recovering irradiated nuclear reactor fuel material is disclosed. This process includes the steps of extracting uranium, plutonium and neptunium from a solution of irradiated fuel, passing this stream to a reflux column, where a high saturation of uranium is maintained. Separation of uranium from plutonium and neptunium, and further decontamination of uranium results from this high saturation. This process is simple, has a high recovery efficiency and high decontamination, uses relatively small amounts of process reagents and produces a relatively small volume of radioactive waste material.

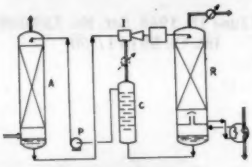
3,714,325
RECOVERY OF MOLYBDENITE
Philip A. Bloom, Stuart J. Hussey, both of Salt Lake City, Utah, and Lamar G. Evans, Salt Lake City, Utah, assignors to the United States of America as represented by the Secretary of the Interior
Filed Nov. 17, 1970, Ser. No. 90,096
Int. Cl. C22b 3/00; B03d 1/00; C22b 15/00
U.S. Cl. 423—53 3 Claims

Low-grade molybdenite flotation products are leached with water at elevated temperature and pressure in an oxidizing atmosphere to selectively dissolve copper, with some sulfur and iron, from sulfide minerals normally present so as to increase the recovery of molybdenite in marketable concentrates.

3,714,326
RECOVERY OF NICKEL AND COBALT FROM REDUCED NICKELIFEROUS ORES
Rapheal F. Matson, New Orleans, La., assignor to Freeport Minerals Company, New York, N.Y.
Filed May 17, 1971, Ser. No. 144,415
Int. Cl. C01g 51/12, 53/12
U.S. Cl. 423—150 4 Claims

In an ammoniacal leaching process for the recovery of nickel and cobalt from reduced nickeliferous ores, copper contamination of the product liquor may be minimized or substantially avoided by controlling oxidation of ore constituents during aeration of a slurry of reduced ore and leach liquor.

3,714,327
GAS PURIFICATION PROCESS
Giuseppe Giammarco, San Marco 3242, Piazzale Morolin, Venice, Italy
Filed Oct. 13, 1969, Ser. No. 865,852
Int. Cl. B01d 53/34
U.S. Cl. 423—220 3 Claims



In a process for removing CO_2 and like acid gases from a gaseous mixture by an absorption solution which is regenerated by boiling above atmospheric pressure, the improvement which is removing the boiling solution from the regeneration and injecting it into an expansion zone, whereby a stream of vapor results containing a portion of the CO_2 etc. from the absorption solution which, being cooled with a reduced CO_2 etc. content is returned to the absorption zone. The stream of vapor is vented.

3,714,328
TREATMENT OF GASES AND LIQUIDS
Thomas Nicklin, Middleton, Manchester, and Fredrick Farrington, Sale, Cheshire, both of England, assignors to The Gas Council, London, England
Filed July 22, 1969, Ser. No. 843,832
Claims priority, application Great Britain, May 28, 1969, 27,059/69; Sept. 20, 1968, 44,880/68; July 25, 1968, 35,613/68
Int. Cl. C01h 17/16; C10g 29/00
U.S. Cl. 423—244 6 Claims

Gases or liquids are steam desulphided in the presence of a catalyst containing a uranium oxide together with a thorium oxide and/or a cobalt oxide. Air may also be present. The process is useful for desulphiding inorganic gases, for example effluent gases and for desulphiding organic compounds such as oils.

3,714,329
PROCESS FOR PREPARING STRONTIUM CARBONATE
Jose L. Arnaud, Modesto, Calif., assignor to FMC Corporation, New York, N.Y.
Filed July 2, 1970, Ser. No. 52,099
Int. Cl. C01f 11/18
U.S. Cl. 423—431 4 Claims

Strontium carbonate is prepared having a desired crystal size by continuously and simultaneously adding an aqueous solution of strontium sulfide and sodium carbonate to a reaction mass containing preformed crystals of strontium carbonate, with sufficient agitation so that the ratio of these reactants is maintained constant throughout the reaction mass.

3,714,330
TREATMENT OF PHOSPHORIC ACID TO RECOVER ALKALI METAL FLUOSILICATES
James E. Barker, Freehold, N.J., assignor to Cities Service Company, New York, N.Y.
Filed Aug. 14, 1970, Ser. No. 63,949
Int. Cl. C01b 25/22, 25/16, 33/32
U.S. Cl. 423—321 6 Claims

Alkali fluosilicates can be recovered from wet process phosphoric acid without contaminating the acid with additional anions, by reacting phosphoric acid with an alkali metal salt, such as sodium chloride, to form the corresponding alkali metal phosphate; extracting the mixture with an organic amine, to remove the contaminating anion; reacting the resultant phosphate solution with wet process phosphoric acid to precipitate an alkali metal fluosilicate, and separating the fluosilicate, thereby leaving residual phosphoric acid. Both the phosphoric acid and the fluosilicate are substantially free of contaminating anion. A portion of the treated phosphoric acid can be recycled for reaction with additional alkali metal salt.

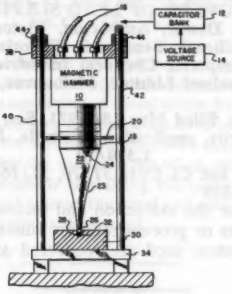
3,714,331
PROCESS FOR THE PRODUCTION OF ALKALI THIOCYANATES
Hans Pfleger, New York, N.Y.; Friedrich Bittner, Bad Saden, and Paul Meffert, Wolfgang, both of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt (Main), Germany
Filed Oct. 6, 1970, Ser. No. 90,183
Claims priority, application Germany, Oct. 8, 1969, P 19 50 671.9
Int. Cl. C01c 3/20; C01g 1/10
U.S. Cl. 423—366 10 Claims

Alkali thiocyanates are prepared by reacting alkali cyanides with sulfur in the presence of alkali sulfide in a molar amount of 1:1000 to 1:2000 as a solubilizer for the sulfur. The reaction is carried out above the melting point of sulfur, preferably in an alkali thiocyanate solution. The alkali sulfide is then converted to the sulfate by oxidation with hydrogen peroxide.

3,714,332
PROCESS FOR MAKING DIAMONDS
John R. Rasquin, Madison, and Marvin F. Estes, Lacey Springs, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Division of Ser. No. 3,418, Jan. 16, 1970, Pat. No. 3,632,242.
This application April 21, 1971, Ser. No. 136,086
Int. Cl. C01b 31/06
U.S. Cl. 423—446 4 Claims

Apparatus and process for the production of diamond is disclosed. The apparatus includes an exponential horn tapering

from a large end to a small end. A copper plate is mounted against the large end of the horn and a magnetic hammer abuts the copper plate. The magnetic hammer and copper plate function to create a shock wave in the exponential horn. An anvil having a small pocket formed therein is mounted adjacent to the small end of the exponential horn so that the small end rests in the pocket. The anvil, horn and hammer are all secured together by bolts or other suitable means and, in



operation, graphite is placed in the anvil pocket. The magnetic hammer generates a shock wave in the exponential horn and because of the horn shape, which is critical, the velocity of the shock wave is amplified and the shock wave energy concentrated so that all of the energy in the shock wave arrives simultaneously at the small end of the horn. This energy is transferred to the graphite in the anvil pocket and results in pressure and temperature levels that causes the graphite to be transformed, in part at least, to diamonds.

3,714,333

METHOD FOR PRODUCING CONCENTRATED NITRIC ACID

Tetsuya Ohrui, Niihama-shi, Yasuhito Sakakibara, Saijo-shi, and Junji Tanaka, Niihama-shi, Japan, assignors to Sumitomo Chemical Company, Limited. Osaka, Japan

Filed May 18, 1971, Ser. No. 144,572

Claims priority, application Japan, May 27, 1970, 45/45,922

Int. Cl. C01b *21/40*

U.S. Cl. 423—392 **7 Claims**

A process for efficiently producing concentrated nitric acid which comprises the steps of (1) absorption of nitrogen peroxide, (2) stripping of nitrogen peroxide, (3) synthesis of concentrated nitric acid from dilute nitric acid, nitrogen peroxide and air, and (4) washing of exhaust gas, characterized in that the 80–90 weight percent concentrated nitric acid obtained in the nitric acid synthesis step is used as an absorbent for nitrogen peroxide; nitrogen peroxide in the fuming nitric acid obtained in the nitrogen peroxide absorption step and the concentrated nitric acid obtained in the nitric acid synthesis step is stripped from concentrated nitric acid with the feed air; the stripped nitrogen peroxide is charged to the nitric acid synthesis step together with the feed air; unreacted nitrogen peroxide contained in the exhaust gas from the nitric acid synthesis step is absorbed in the feed dilute nitric acid and is then recycled to the nitric acid synthesis step; and unabsorbed gas in the exhaust gas washing step is recycled to the nitrogen peroxide absorption step.

3,714,334

PROCESS FOR EPITAXIAL GROWTH OF DIAMONDS

Earl C. Vickery, Phoenix, Ariz., assignor to Diamond Squared Industries Inc., Scottsdale, Ariz.

Filed May 3, 1971, Ser. No. 139,813

Int. Cl. C01b *31/06*

U.S. Cl. 423—446 **6 Claims**

A method for growing diamonds in the form of diamond dust, industrial grade diamonds and the like, by epitaxy comprising the steps of providing a diamond seed crystal, contacting said diamond seed crystal with a hydrocarbon having from one to about five carbon atoms in an environment consisting of at least 95 percent hydrogen gas by volume and about no more than 5 percent of the said hydrocarbon by volume, maintaining the temperature of the reaction environment in the range of from about 1,100°C. to about 1,700°C., and reacting the said diamond seed crystal with the said hydrocarbon and the hydrogen gas in the presence of a catalyst being a member selected from the group consisting of platinum and paladium, thereby causing said hydrocarbon to form diamond carbon and deposit it on the surface of said diamond seed crystal while simultaneously causing less stable forms of carbon also formed from said hydrocarbon to react with the hydrogen gas in the presence of the catalyst and the temperature conditions to form additional quantities of hydrocarbon, said process continuing until the desired diamond growth has been achieved.

3,714,335

PROCESS FOR PRODUCING HF AND NITRILOTRIACETONITRILE

Paul Kobetz and Kenneth L. Lindsay, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Jan. 29, 1971, Ser. No. 111,134

Int. Cl. C01b *7/22*; C07c *131/42*

U.S. Cl. 423—483 **8 Claims**

It is disclosed that hydrofluoric acid and nitrilotriacetonitrile can be co-produced from fluosilicic acid, ammonia, formaldehyde and hydrogen cyanide. The fluosilicic acid typically is used in a preliminary reaction with ammonia and water to produce ammonium fluoride which is then reacted with formaldehyde and hydrogen cyanide coincidentally or in sequence. The product hydrofluoric acid is readily recovered by distillation leaving a co-product amine nitrile.

3,714,336

REGENERATION OF ACTIVATED CHARCOAL CATALYST USED IN SULFURYL FLUORIDE PRODUCTION

Ralph A. Davis and Keith A. Allswede, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,880

Int. Cl. C01b *17/45*; C01j *11/02*

U.S. Cl. 423—468 **7 Claims**

Disclosed is a method of regenerating the activated charcoal catalyst used in the production of sulfuryl fluoride by reaction of sulfur dioxide, chlorine and hydrogen fluoride. The method involves reducing the spent catalyst with a hydrogen stream at 400° to 800° C. for at least about 0.5 hour at a space velocity of from 50 to 5,000 cu. ft. of hydrogen per cubic ft. of catalyst per hour.

3,714,337
PREPARATION OF INORGANIC PIGMENTS
Pierre Garet, Thiais, France, assignor to Rhone-Poulenc S.A., Paris, France
No Drawing. Filed Dec. 21, 1970, Ser. No. 100,352
Claims priority, application France, Dec. 23, 1969, 6944647
Int. Cl. C01b *17/20, 19/00*
U.S. Cl. 423—508 2 Claims

Metal sulphides, sulpho-selenides and selenides are made by heating together at 340 to 450° C. a molten mixture of metal, sulphur and/or selenium, and saline flux.

3,714,338
TREATING A WATER STREAM CONTAINING A SULFITE COMPOUND TO PRODUCE ELEMENTAL SULFUR
Peter Urban, Northbrook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Dec. 18, 1970, Ser. No. 99,482
Int. Cl. C01b *17/02*
U.S. Cl. 423—571 21 Claims

A water stream containing a water-soluble sulfite compound is treated in order to produce elemental sulfur while minimizing the formation of sulfate by-products by the steps of: (a) converting the sulfite compound contained in the water stream to the corresponding thiosulfate compound; (b) treating the resulting thiosulfate compound with a water-soluble sulfide compound and a reducing agent, selected from the group consisting of carbon monoxide, hydrogen and mixtures thereof, at reduction conditions selected to result in an effluent stream containing a polysulfide compound; (c) decomposing the resulting polysulfide compound to form elemental sulfur, a sulfide compound, a treated water stream and; (d) recovering the resulting sulfide compound and passing same to step (b). Principal utility of this treatment procedure is associated with the regeneration of a sulfite-containing absorbent stream which is commonly produced by contacting a flue gas stream containing sulfur dioxide with a suitable aqueous absorbent stream containing an alkaline reagent.

3,714,339
METHOD OF PREPARING METALLIC SELENIDES
Aron Vecht, London, England, assignor to BDH Chemicals Limited, London, England
Filed Nov. 3, 1970, Ser. No. 86,627
Claims priority, application Great Britain, Nov. 10, 1969, 54,879/69
Int. Cl. C01g *9/00, 11/00*
U.S. Cl. 423—509 8 Claims

A process for the preparation of metallic selenides is provided which comprises homogeneous precipitation of a selenide from a solution of a compound of the metal and a compound of selenium. Zinc and cadmium selenides are particularly produced. The products are of high purity and have extremely homogeneous properties.

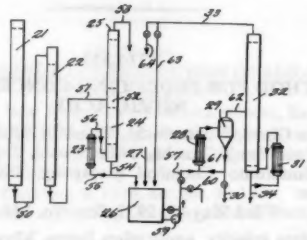
3,714,340
PROCESS FOR THE PREPARATION OF SODIUM DITHIONITE
Ryozo Fujiwara, Eiji Ohara, Kazuo Maeda, Fumio Terada, Toshiyuki Sugino, Hiroyasu Arakane, and Yoshimoto Watanabe, Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
No Drawing. Filed Nov. 3, 1970, Ser. No. 86,633
Claims priority, application Japan, Nov. 7, 1969, 44/88,778
Int. Cl. C01b *17/98*
U.S. Cl. 423—515 4 Claims

A process for preparing sodium dithionite which comprises blowing sulfur dioxide at a temperature of 65–80° C. into an aqueous methanol solvent containing a mixture of sodium formate and an alkali selected from the group consisting of sodium hydroxide and sodium carbonate, the amount of alkali being 20–40 parts by weight, as sodium hydroxide, the amount of sulfur dioxide being 90–135 parts by weight, and the amount of solvent being 380–700 parts by weight, per 100 parts by weight of sodium formate.

3,714,341
PROCESS FOR THE PRODUCTION AND RECOVERY OF LEAD SULPHATE
Robert Alfred Dewar, Ashburton, Victoria, and Erwin Gunther Walliczek, Beaumaris, Victoria, Australia, assignors to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Victoria, Australia
No Drawing. Filed May 18, 1971, Ser. No. 144,632
Claims priority, application Australia, June 1, 1970, 1,370/70
Int. Cl. C01g *31/20, 31/16*
U.S. Cl. 423—559 3 Claims

A process for the extraction and recovery of lead sulphate from ores or process residues wherein the reagents and solvent system used are recovered and reused with high efficiency.

3,714,342
PROCESS FOR THE PRODUCTION OF HYDROGEN PEROXIDE
Gerhard Kabisch, Rheinfelden, Germany, assignor to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt (Main), Germany
Filed Sept. 2, 1970, Ser. No. 68,977
Claims priority, application Germany, Sept. 10, 1969, P 19 45 754.6
Int. Cl. C01b *15/02*
U.S. Cl. 423—588 8 Claims



Hydrogen peroxide low in carbon containing impurities is produced by the anthraquinone process first by water topping off (stripping) the crude H_2O_2 product accumulating in the extraction step of the cyclic process and then distilling the water stripped H_2O_2-product.

3,714,343
ALUMINA HYDRATE, δ-ALUMINA AND A METHOD FOR THE MANUFACTURE THEREOF
Shozo Sato and Yoshihisa Otaka, Tokyo, and Yukio Takigawa, Kawasaki-shi, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan
Filed June 24, 1968, Ser. No. 739,240
Claims priority, application Japan, June 26, 1967, 42/40,470; July 24, 1967, 42/47,344; Dec. 18, 1967, 42/80,806
Int. Cl. C01f *7/02, 7/34*
U.S. Cl. 423—628 9 Claims

A pure alumina hydrate, having uniform pores, is manufactured from an aluminum salt of a monobasic acid and

in the presence of an acid carbonate. Calcination of this pure alumina hydrate produces a pure θ-alumina having uniform pores. This θ-alumina may be used as an adsorbent in gas chromatography.

3,714,344
METHOD FOR DETERMINING THYROXINE IN BLOOD SERUM AND REAGENT THEREFOR
James L. Brown, St. Louis, Mo., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.
Filed Oct. 13, 1969, Ser. No. 865,785
Int. Cl. A61k *27/04*
U.S. Cl. 424—1 9 Claims

An improved method for determining the thyroxine content of blood serum with the aid of a radioactive thyroxine tracer employs a reagent consisting of blood serum from which most of the naturally occurring thyroxine has been removed, for example by passing the serum through an ion-exchange column. Also, by comparing the radioactivity of an unknown sample with reference standards containing the same amount of alcohol from the same source, the usual and time-consuming alcohol evaporation step is eliminated.

3,714,345
STABILIZED ERYTHROCYEES AND METHODS THEREFORE
Arthur Atsunobu Hirata, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Continuation-in-part of Ser. No. 760,052, Sept. 16, 1968, abandoned, which is a continuation-in-part of Ser. No. 682,550, Nov. 13, 1967, abandoned. This application Feb. 22, 1971, Ser. No. 117,790
Int. Cl. A01n *1/00*; G01n *31/00, 33/16*
U.S. Cl. 424—3 5 Claims

A method for obtaining an improved aldehyde-treated erythrocyte preparation having an increased hemagglutination titer. The erythrocytes are stabilized by sequential exposure to dilute solutions of pyruvic aldehyde and formaldehyde.

3,714,346
TWO-PART ALUMINUM SALT ANTIPERSPIRANT AEROSOL COMPOSITIONS
Joseph Gubernick, 11 Cove Lane, Port Washington; Robert J. Krause, 3121 Middletown Road, Bronx; Amos Lerner, 6420 Saunders St., Rego Park, all of N.Y., and Gianni Mosca, 126 E. Avenue, Norwalk, Conn.
Filed June 19, 1970, Ser. No. 47,872
Int. Cl. A61k *7/00*
U.S. Cl. 424—47 3 Claims

Antiperspirant aluminum salt compositions suitable for dispensing as an aerosol spray from dual dispensing aerosol containers containing the aluminum salt in one chamber of the container and the propellant in the other chamber.

3,714,347
METHOD OF TREATING PROSTATIC HYPERTROPHY
Harry W. Gordon, New York, N.Y., assignor to Julius Schmid Inc., New York, N.Y.
Continuation-in-part of Ser. No. 544,712, April 25, 1966, abandoned, and a continuation of Ser. No. 623,847, March 17, 1967, Pat. No. 3,584,118. This application Sept. 8, 1970, Ser. No. 70,509
Int. Cl. A61k *21/00*
U.S. Cl. 424—115 3 Claims

Orally administered compositions for treating prostatic hypertrophy are described herein, these compositions contain an effective dose of mediocidin, a polyenic macrolide nucleus. Also the method of treating prostatic hypertrophy with such compositions, is described herein.

3,714,348
METHOD FOR CONTROLLING ABSORPTION OF CHOLESTEROL
Harry W. Gordon, Bronx, N.Y., and Carl P. Schaffner, Trenton, N.J., assignors to Julius Schmid Inc., New York, N.Y.
No Drawing. Continuation of application Ser. No. 627,313, Mar. 31, 1967, now Patent No. 3,627,879, dated Dec. 14, 1971. Divided and this application Dec. 2, 1970, Ser. No. 94,593
The portion of the term of the patent subsequent to June 8, 1988, has been disclaimed
Int. Cl. A61k *21/00*
U.S. Cl. 424—117 8 Claims

The method of orally administering compositions for controlling absorption of cholesterol are described herein, these compositions containing an effective dose of a heptaene polyenic macrolide selected from the class consisting of candicidin, fungimycin, amphotericin B, trichomycin, hamycin, candidin and ayfactin.

3,714,349
NON-CORROSIVE NON-FLAMMABLE, LOW TOXIC ORGANOPHOSPHORUS DETOXIFYING SOLUTION
Billy C. Wolverton, Fredericksburg, Va., assignor to the United States of America as represented by the Secretary of the Navy
No Drawing. Filed Dec. 14, 1965, Ser. No. 513,811
Int. Cl. A01n *11/00*
U.S. Cl. 424—149 1 Claim

A non-toxic, non-corrosive, non-flammable decontaminant for chemical and biological warfare agents, consisting of a solution of 50–70% by volume of monoethanolamine, 30–50% by volume of a glycol, 5–10% by volume of an active antiseptic chlorine compound selected from the group consisting of chloramine-T, dichloramine-T, and calcium hypochlorite solution and 0.5–1.0% by weight of the other ingredients of histidine.

3,714,350
PHOSPHORYL AND THIOPHOSPHORYL PYRONES AS INSECTICIDES
Stanley T. D. Gough, Raritan, N.J., assignor to Mobil Oil Corporation
No Drawing. Original application Sept. 13, 1967, Ser. No. 667,380. Divided and this application Mar. 10, 1969, Ser. No. 813,394
Int. Cl. A01n *9/36*
U.S. Cl. 424—203 6 Claims

New compounds from the classes of phosphoryl 2-pyrones, phosphoryl 2-pyridones and phosphoryl thio-2-pyrones are provided. The phosphorus moiety is preferably attached to the 4-position of the ring structure, and contains organic substituents attached directly to the phosphorus atom or attached thereto through an atom of oxygen or sulfur.

The new compounds are useful pesticides, and methods are provided for using them for same.

3,714,351
CERTAIN 3 - HYDROXY-TRIAZENES AND THEIR USE IN CONTROLLING INSECTS AND ARACHNIDS
Kurt Gubler, Riehen, near Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
No Drawing. Filed Jan. 26, 1970, Ser. No. 5,953
Claims priority, application Sweden, Nov. 14, 1969, 1,169/69
Int. Cl. A01n *9/20*
U.S. Cl. 424—226 12 Claims

3-hydroxy-triazenes, which possess growth inhibiting properties and which may be used for controlling insects, arachnids and developmental stages thereof are disclosed.

3,714,352

METHOD OF INDUCING ANAESTHESIA

Benjamin Davis, Chalfont St. Peter, and Gordon Hanley Phillipps, Wembley, England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

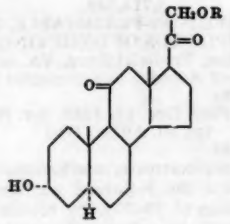
No Drawing. Filed June 17, 1970, Ser. No. 47,163

Claims priority, application Great Britain, June 20, 1969, 31,371/69

Int. Cl. A61k *27/00*

U.S. Cl. 424—243 15 Claims

As an anaesthetic composition for parenteral administration, an aqueous solution containing at least 1 mg./ml. of 3α-hydroxy-5α-pregnane-11,20-dione and at least 1% by weight of a parenterally acceptable non-ionic surface active agent having an HLB value of from 9–18. The solution also preferably contains to increase the solubility of the 3α-hydroxy-5α-pregnane-11,20-dione, at least one steroid of the formula



wherein R is selected from the group consisting of a lower alkanoyl group, a hemisuccinoyl group and a benzoyl group.

3,714,353

THERAPEUTIC COMPOSITIONS COMPRISING A 6α,9α-DIFLUORO-11β,17α,21-TRIHYDROXY-16α-METHYL-1,4-PREGNADIENE-3,20-DIONE AND 21-ACYLATES

Frank H. Lincoln; William P. Schneider, and George B. Spero, all of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 753,157, Aug. 4, 1958, Pat. No. 3,499,016. This application Aug. 11, 1959, Ser. No. 832,899. The portion of the term of this patent subsequent to March 3, 1987, has been disclaimed.

Int. Cl. C07c *169/32*; A61k *15/02*

U.S. Cl. 424—243 8 Claims

This invention relates to therapeutic compositions and more particularly to therapeutic compositions comprising a 6α,9α-difluoro-11β,17α,21-trihydroxy-16α-methyl-1,4-pregnadiene-3,20-dione and 21-acylates and water-ssoluble salts thereof as an essential active ingredient in combination with a pharmaceutical vehicle.

3,714,354

BRONCHODILATOR ACTIVITY OF SUBSTITUTED QUINAZOLINECARBOXYLIC ACID ESTERS

John G. Stam, New York, N.Y., assignor to Pfizer Inc., New York, N.Y.

Filed July 6, 1971, Ser. No. 160,089

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 2 Claims

The process of producing bronchial dilation which comprises administering to a subject an effective amount of a substituted quinazolinecarboxylic acid ester.

3,714,355

MEDAZEPAM AND PROPANTHELINE COMPOSITION

Irwin Lerner, West Caldwell, and Robert Paul McGrath, Wayne, both of N.J., assignors to Hoffman-La Roche, Inc., Nutley, N.J.

Filed May 6, 1971, Ser. No. 141,034. The portion of the term of this patent subsequent to Oct. 24, 1989, has been disclaimed.

Int. Cl. A61k *27/00*

U.S. Cl. 424—244 4 Claims

Compositions comprising medazepam and propantheline halide, useful in treating gastrointestinal disorders are disclosed.

3,714,356

ANTIBACTERIAL COMPOSITION AND METHOD

Stanley E. Burrous; William W. Eudy, and Arthur J. Siedler, all of Norwich, N.Y., assignors to Morton-Norwich Products, Inc.

Filed Jan. 18, 1971, Ser. No. 107,518

Int. Cl. A61k *21/00*

U.S. Cl. 424—271 2 Claims

An antimicrobial composition consisting of ampicillin and L-3-(3,4-dihydroxyphenyl)alanine or 3,4-dihydroxyphenylacetic acid is more efficacious than ampicillin alone in the treatment of pyelonephritis.

3,714,357

PHARMACEUTICAL COMPOSITIONS COMPRISING QUINUCLIDINOL DERIVATIVES

Claude Gueremy, Houilles, Robert Labey, Le Vesinet, and Roger Thevenot, Paris, France, assignors to Societe Generale de Recherches d'Applications Scientifiques "Sogeras," Paris, France

No Drawing. Filed July 15, 1969, Ser. No. 841,970

Claims priority, application Great Britain, July 15, 1968, 33,564/68

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 19 Claims

Pharmaceutical compositions comprising a quinuclidinol derivative and an inert physiologically acceptable carrier have useful cholinolytic properties.

3,714,358

THIADIAZOLE HYDRAZONES AS FUNGICIDES

Chester G. Lemanski, East Brunswick, N.J., assignor to Mobil Oil Corporation

Filed June 22, 1970, Ser. No. 48,492

Int. Cl. A01n *9/12, 9/22*

U.S. Cl. 424—270 9 Claims

Certain 1,3,4-thiadiazol-2-yl hydrazones form a new class of fungicides. They are highly effective as spore fungicides against Monolinia fructicola and Stemphylium sarcinaeforme. They also are highly effective as soil fungicides against Fusarium oxysporium, Pythium debaryanum, Rhizoctonia solani, and Sclerotium rolfsii.

3,714,359

COMPOSITIONS WITH ADRENOLYTIC ACTION FOR USE IN THERAPY

Guy Dedieu, 72 Rue du Palais Gallien, 33 Bordeaux, France, and Claude Dufour, 72 Rue Delabordere, 92 Neuilly-sur-Seine, France

Continuation-in-part of application Ser. No. 751,761, Aug. 12, 1968. This application Feb. 6, 1969, Ser. No. 797,195

Claims priority, application France, Mar. 31, 1967, 101,148; Aug. 8, 1968, 162,424

Int. Cl. A61k *27/00*

U.S. Cl. 424—311 15 Claims

Information concerning the therapeutic action of the citrates of 2-acetyl-5-ethoxydimethylamino carvacrol is disclosed. Experiments show that the products

counteract the adverse effects of adrenaline at the level of the alpha acceptors. This action is specific and distinguishes the products described over the known sympatholytic agents, thereby providing pharmaceutical preparations which are particularly effective and well tolerated in the case of disorders, particularly occlusions of the arterial system.

3,714,360

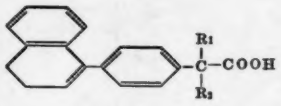
α - (BENZCYCLOALKYLPHENYL)-ALIPHATIC ACIDS AS ANTI-INFLAMMATORY AND HYPOCHOLESTEROLEMIC AGENTS

William Laszlo Bencze, New Providence, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Feb. 16, 1970, Ser. No. 11,889
Int. Cl. A61k *22/00*
U.S. Cl. 424—317 2 Claims

ABSTRACT OF THE DISCLOSURE

α - [Benzcycloalk(en)ylphenyl] - aliphatic acids, e.g. those of the formula



R_1=H or alkyl
R_2=H, alk(en)yl, cycloalk(en)yl or cycloalk(en)yl-alkyl

and functional acid derivatives thereof are hypochloesterolemic and anti-inflammatory agents.

3,714,361

CERTAIN HYDROXAMIC ACIDS AS GROWTH PROMOTING AGENTS

Kazuo Morimoto, Tsu-shi, and Etsuo Naito, Hannou-shi, Japan, assignors to Eisai Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Jan. 21, 1970, Ser. No. 4,778
Int. Cl. A61k *27/00*
U.S. Cl. 424—320 6 Claims

Livestock growth-promoting agent consisting of hydroxamic acid represented by the formula

R—CO—NH—OH

wherein R stands for an alkyl group. The growth-promoting agent according to the present invention is daily administrated to livestock in an amount ranging 1–30 mg. per kg. of the body-weight thereof advantageously in admixture with foodstuff. Feed conversion of the feed therefor intake is thus considerably enhanced. This results in a marked increment in the body-weight of the reared animals without undesirable effects such as an accumulation of the said agent in the body or organs of the reared animals and an acclimation of the animals toward the agent so that the animals are insensible to the latter, contrary to the known antibiotics hitherto employed as the growth-promoting agent.

3,714,362

ACETIC ACID DERIVATIVES AS HYPOLIPIDEMICS

Rudolf G. Griot, Riehen, Baselland, Switzerland, assignor to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 734,226, June 4, 1968, abandoned. This application April 29, 1970, Ser. No. 33,045
Int. Cl. A61k *27/00*
U.S. Cl. 424—324 5 Claims

This disclosure relates to halo-substituted diphenoxyacetic acid amides and to the use of such compounds as hypolipidemics, e.g., the novel compound bis)p-iodophenoxy) acetic acid amide and the known compound bis(p-chlorophenoxy) acetic acid amide.

3,714,363

SUBSTITUTED AMINO GUANIDINE AS ANTI-DIABETIC AGENTS

Robert E. Manning, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Aug. 11, 1970, Ser. No. 63,000
Int. Cl. H61k *27/00*
U.S. Cl. 424—326 5 Claims

Substituted aminoguanidines, e.g. γ-phenylpropylaminoguanidine hydronitrate, are useful as anti-obesity/anti-diabetic agents.

3,714,364

PROCESS FOR LOWERING BLOOD SUGAR LEVELS

James M. McManus, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed April 9, 1971, Ser. No. 132,803
Int. Cl. A61k *27/00*
U.S. Cl. 424—326 6 Claims

m- and p-Fluorobenzylguanidines and their acid addition salts have been prepared and found to be active as hypoglycemic agents. m-Fluorobenzyl-guanidine hydrogen sulfate and p-fluorobenzylguanidine hydrogen sulfate are particularly effective in lowering blood sugar levels by the oral route of administration.

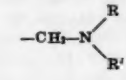
3,714,365

REDUCING ABNORMALLY HIGH PLASMA LIPID LEVELS IN MAMMALS WITH PHENOLS

Sidney I. Lerner, Cincinnati, Ohio, assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 357,777, Apr. 6, 1964. This application Mar. 12, 1970, Ser. No. 19,080
Int. Cl. A61k *27/00*
U.S. Cl. 424—330 8 Claims

Plasma lipid levels are reduced by internally administering a phenol having a nitrogen-containing group bonded to the phenolic nucleus. A typical nitrogen-containing group is



Exemplary phenols are 2,6-di-tert-butyl-α-dimethylamino-p-cresol and α,α'-(methylimino)bis(2,6 - di-tert-butyl-p-cresol). Trinuclear phenols are also disclosed as are salts such as hydrochlorides.

3,714,366

METHOD FOR THE PRODUCTION OF MORDENITE

Yasuhiko Fukuda, Ichikawa-shi, and Noboru Yuyuma, Matsudo-shi, Japan, assignors to Nippon Chemical Industrial Co., Ltd., Tokyo, Japan

No Drawing. Filed Sept. 10, 1969, Ser. No. 856,842
Claims priority, application Japan, Sept. 10, 1968, 43/64,628
Int. Cl. C01b *33/28*
U.S. Cl. 423—329 1 Claim

Crystalline zeolites including mordenite and analcite are produced by heating an alkali metal silicate glass com-

prising SiO_2, M_2O, and Al_2O_3 wherein M is sodium or potassium, the molar ratio of SiO_2/M_2O ranging from about 1 to 4 and the Al_2O_3 being present in an amount up to 10% by weight (preferably 0.1–5%) based on the weight of SiO_2 and M_2O, in water at a temperature of from about 110 to 210° C. until the zeolite product forms. Auxiliary raw materials such as powdered silica sand, silica sol, silica gel, diatomaceous earth, sodium or potassium hydroxides or carbonates, sodium aluminate, aluminum hydroxide, and alumina sol can be used with the alkali metal silicate glass.

3,714,367

POLYENE COLORING COMPOSITIONS

Hugo Gutmann; Ulrich Manz, both of Reinnach, and Ulrich Schwieter, Arlesheim, all of Switzerland, assignors to Hoffmann-La Roch Inc., Nutley, N.J.

Division of Ser. No. 608,487, Jan. 11, 1967, Pat. No. 3,577,464. This application Jan. 4, 1971, Ser. No. 103,880

Int. Cl. A61k *27/00*

U.S. Cl. 424—333 **6 Claims**

Conjugated polyene dialdehyde compounds useful as coloring agents for foodstuffs, pharmaceutical preparations and cosmetic preparations.

ELECTRICAL

3,714,368

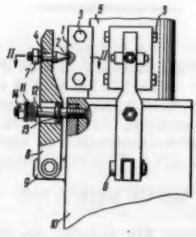
CURRENT FEEDER TO A MOVING CURRENT-CARRYING SURFACE

Konstantin Trofimovich Nautny, Viktor Iosifovich Lakomsky, and Anatoly Ivanovich Chvertko, Kiev, Semen Yakovlevich Shekhter and Alexandr Mikhailovich Reznitsky, Kommunarsk Voroshilovgradskoi Oblasti, and Viktor Romanovich Pilipchuk, Kiev, U.S.S.R., assignors to Institut Elektrosvarki Imeni E. O. Patona Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Filed Feb. 17, 1972, Ser. No. 227,188

Int. Cl. H05b *7/10*

U.S. Cl. 13—16 **2 Claims**



A current feeder to the current-carrying surface of an electric furnace has a brush with a groove to receive the blade of a knife. The shape of the groove corresponds to the V-shape of said blade allowing the brush to freely shift with respect to the knife remaining uniformly pressed against the moving surface.

3,714,369

PEDESTAL FOR ELECTRICAL CIRCUIT COMPONENTS HAVING A FLEXIBLE PROTECTIVE DIELECTRIC SHIELD

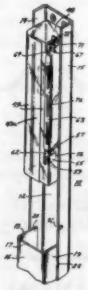
Theodore M. Bunten, Rydal, Pa., assignor to Repco Products Corporation, Philadelphia, Pa.

Continuation-in-part of application Ser. No. 192,253, Oct. 26, 1971. This application Dec. 28, 1971, Ser. No. 212,942

Int. Cl. H02g *9/00*

U.S. Cl. 174—38 **5 Claims**

A hollow vertical pedestal or terminal housing is disclosed having a bottom section for support and cable entrance, and an upper section, the front and top being removable for access to the interior into which cables and the like to be connected are terminated, the upper section at the back being provided with brackets for attachment of electrical circuit components and a protective shield of flexible dielectric material being provided to



enclose the circuit components and provide a dielectric shield, a dust shield and a snow and weather shield.

3,714,370

PLASTIC PACKAGE ASSEMBLY FOR ELECTRONIC CIRCUIT AND PROCESS FOR PRODUCING THE PACKAGE

David Nixen, Anaheim, and Chune Lee, Costa Mesa, Calif., assignors to North American Rockwell Corporation

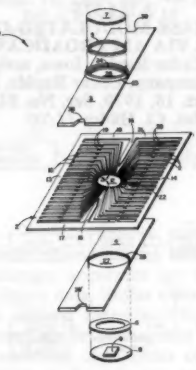
Continuation of application Ser. No. 62,375, Aug. 10, 1970. This application Jan. 24, 1972, Ser. No. 220,024

Int. Cl. H05k *5/00*

U.S. Cl. 174—52 S **4 Claims**

This invention is directed to a process for making a package and for the package which has a semiconductive device therein and comprises a plurality of conductor leads terminating in a central opening in the package. A header in the package comprises sidewalls of synthetic resin material in direct contact with the leads. The header includes the central opening and the leads have portions thereof extending outward from the header. A metallic cover having a gold facing is used for bonding the semiconductive material of the device directly to the gold facing. The periphery of the metallic cover is attached to the synthetic resin material at one end of the central opening and forms a chamber within which the semiconductive device is housed. The metallic cover also provides structural support for the semiconductive device and is an integral part of the package. The leads which are attached to the semiconductive device extend outward from the package for

providing input and output connective paths to and from the semiconductive device. Another cover is used at the



opposite end, opposite to the first cover, of the package to seal the chamber and the device.

3,714,371

ALUMINUM CLAD MULTIPLEX SUPERCONDUCTOR

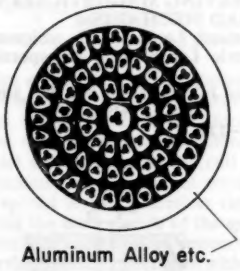
Harehiko Nomura and Susumu Shimamoto, Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,199

Claims priority, application Japan, Dec. 28, 1970, 46/20,120

Int. Cl. H01v *11/00*

U.S. Cl. 174—126 CP 3 Claims



An aluminum clad multiplex superconductor comprises an aluminum alloy cladding and a multiplex superconductor inserted into the cladding and is constructed with a plurality of unit superconductors twisted or braided with each other, each of which unit superconductors is constructed with a strand of a plurality of superconductive wires, an intermediate aluminum layer and a relatively hard aluminum alloy layer surrounding the intermediate layer. The intermediate aluminum layer serves to prevent the flowing phenonmenon during the wiredrawing of the unit superconductor.

3,714,372

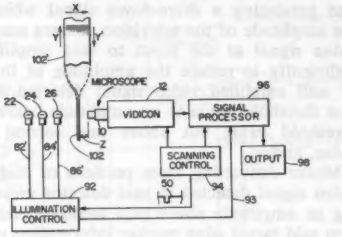
METHOD AND APPARATUS FOR COUNTING AND CLASSIFYING MICROSCOPIC PARTICLES

Alfred H. Rosen, Newton, and Lester C. Smith, Newton Upper Falls, Mass., assignors to Cognos Corporation, Newtonville, Mass.

Filed June 1, 1970, Ser. No. 41,906

Int. Cl. H04n *5/76, 7/18, 9/06*

U.S. Cl. 178—6.8 14 Claims



Method and apparatus for counting and classifying blood cells, including white cells, using pulses of light to form colored microscope images in a television camera. Flash lamps filtered for different spectral zones are operated in sequence to form the images, which are scanned to generate electrical signals representing properties, including color, of each image.

3,714,373

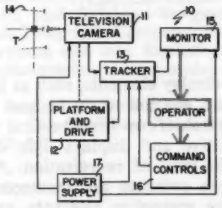
APPARATUS AND INFORMATION PROCESSING METHODS FOR A TRACKING SYSTEM TRACKER UNIT

Richard B. Kuhn, Columbus, Ohio, assignor to North American Rockwell Corporation

Filed Oct. 12, 1964, Ser. No. 403,400

Int. Cl. H04n *3/00*

U.S. Cl. 178—6.8 9 Claims



1. In a tracking system tracker unit which develops tracking error correction signals using target edge marker information derived from a television camera sensor output video signal and using coincident horizontal and vertical tracking gates to control the viewing axis of the television camera sensor in aligned tracking relation to a selected target, in combination:

(a) Amplifier means which receives said television camera sensor output video signal and produces an amplified video signal,

(b) Detector means detecting first voltage amplitudes in said amplified video signal above a first threshold value and second voltage amplitudes in said amplified

video signal above a second threshold value that is below said first threshold value,

(c) Gate means receiving said detected first voltage amplitudes and the horizontal and vertical tracking gate pulse of the tracker unit and gating the received portion of said detected first voltage amplitudes and said tracking gate pulses that are time-coincident as a triggering signal,

(d) Time-delay means triggered by said triggering signal and establishing a delay of fixed time duration,

(e) Drive-down circuit means activated at the end of the time-delay established by said time-delay means and producing a drive-down signal which reduces the amplitude of the television camera sensor output video signal at the input to said amplifier means sufficiently to reduce the amplitude of that portion of said amplified video signal detected above said first threshold value to an amplitude below said first threshold value but above said second threshold value, and

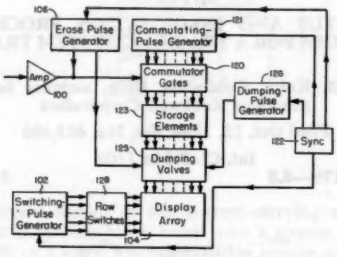
(f) Means converting those portions of said amplified video signal detected in said detector means as having an amplitude above said second threshold value into said target edge marker information used to develop the tracking error correction signals.

3,714,374

IMAGE-DISPLAY PANEL WITH BREAKDOWN-SWITCH ADDRESSING

Alan Sobel, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 21, 1971, Ser. No. 135,954
Int. Cl. H04n *3/14*
U.S. Cl. 178—7.3 D **26 Claims**



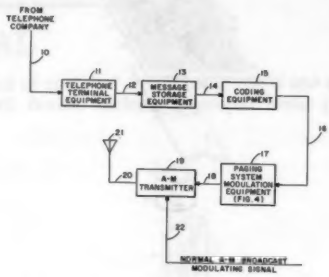
A plurality of display elements, such as light generators or modulators, are distributed throughout an image display panel in horizontal rows and vertical columns. Each element is capacitive and displays light of an intensity proportional to its level of energization. A like plurality of breakdown-type switches are connected individually in series with the respective elements, each switch assuming a conductive or low-impedance condition in response to a control potential exceeding a firing level and assuming a non-conductive or high-impedance condition when the applied voltage falls below a predetermined lower level. The combination of each switch and the capacitance of its associated display elements exhibits a bistable switching characteristic. In response to column-selection signals, different columns are selectively addressed with pulses exceeding the firing level. The different columns are also addressed after firing with individual modulating pulses whose amplitude represents the picture information. At the same time, row-selection signals selectively address different rows of the switches and display elements in order to complete respective return circuits for the firing and modulating pulses. Various scanning circuits and systems, all employing breakdown switches of a type amenable to integration with the display panel, are also described.

3,714,375

SECONDARY PHASE MODULATED COMMUNICATIONS SERVICE VIA AM BROADCAST STATIONS

Harris A. Stover, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed Oct. 16, 1970, Ser. No. 81,216
Int. Cl. H04m *11/00*
U.S. Cl. 179—2 E **8 Claims**



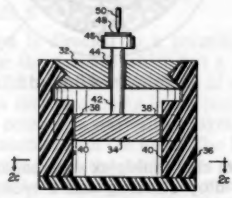
A secondary communications system for use with AM broadcast stations employs encoding predefined messages which may be initiated by dialing predetermined decimal digits or initiatng touch-tone sequences in the telephone system, converting these digits to a predetermined binary code sequence or binary "word," and transmitting the code word by a non-interfering phase modulation of the AM broadcast station carrier wave. Subscriber receivers, fixed-tuned to the broadcast station carrier, are equipped with simple code recognition means which, in response to reception of one or more preassigned coded "words," activate associated indicators to visually or audibly annunciate predetermined messages to the subscriber.

3,714,376

SHOCK RESISTANT SEMICONDUCTOR MICROPHONE HAVING MAGNETICALLY OPERATED OVERLOAD MECHANISM

David F. Hiestand, Lombard, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 26, 1971, Ser. No. 166,175
Int. Cl. H04r *23/00*
U.S. Cl. 179—110 B **2 Claims**



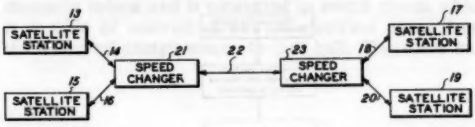
An electroacoustic transducer of the stressed semiconductor type wherein the stressing member or semiconductor is mounted on a first member which is magnetically coupled with a selected breakaway force to a fixed mounting member. Overload stress overcomes the magnetic coupling thereby permitting the stressing member and semiconductor element to separate and thus prevent mechanical damage to the transducer.

3,714,377

STORE AND FORWARD SPEED CHANGER FOR OFF-LINE TRANSMISSION OF BINARY DATA

Alfred J. Moretti, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Mar. 16, 1966, Ser. No. 534,811
Int. Cl. H04j 3/18
U.S. Cl. 179—15.55 R 3 Claims



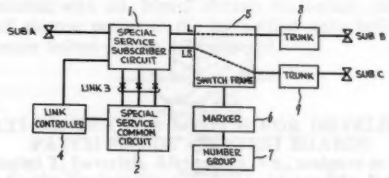
Graphic communication systems utilizing a store and forward speed changer apparatus for improving off-line transmission of binary data. Buffer units and speed changing apparatus is utilized for selectively altering the bit rate of information to be transmitted as a function of the respective bandwidth capabilities of the immediately utilized transmission media in a net type communication link.

3,714,378

SPECIAL SERVICE SPEECH TRANSFER EQUIPMENT FOR TELEPHONE EXCHANGE SYSTEMS

Yutaka Kimura and Yoshio Ariizumi, Tokyo, Yutaka Masuda, Hasuda-machi, Teruhiro Yamagami, Yokohama, and Yasushi Okita, Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Oki Electric Industry Co., Ltd., both of Tokyo, Japan

Filed Dec. 10, 1969, Ser. No. 883,871
Int. Cl. H04m 3/42
U.S. Cl. 179—18 B 3 Claims



A special service subscriber circuit associated with each subscriber is connected by a link to a common special service circuit. A speech connection is formed via the speech connection of the telephone switching equipment through the special service subscriber circuit by diverting the speech connection into the special service common circuit from the special service subscriber circuit through the link by flashing the hook switch of the special service subscriber. Call waiting and holding services are provided on the special service speech connections which are different from the normal speech connections.

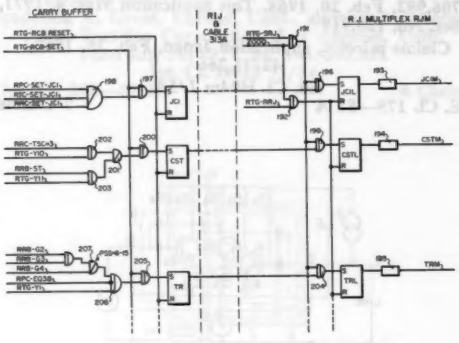
3,714,379

SWITCHING ARRANGEMENT FOR CONTROLLING PERIPHERAL UNITS IN A TIME DIVISION MULTIPLEX COMMON CONTROL SYSTEM

John E. Busch, Clarendon Hills, and Sergio E. Puccini, Wood Dale, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 26, 1972, Ser. No. 220,990
Int. Cl. H04q 11/04
U.S. Cl. 179—18 J 14 Claims

A switching arrangement is employed in a register-sender subsystem of a telephone switching system of the type having a plurality of registers sharing common memory and logic circuits on a time division multiplex basis, each register being individually associated via a multiplexing unit with a plurality of register junctors serving as peripheral units for connection to a calling line during an originating portion of a call to receive call signals so that a connection can be established to a called line during a terminating portion of a call. Each one of the register junctors includes a plurality of pairs of originating and terminating indicating devices responsive to call processing signals from the registers, originating ones of the pairs of indicating devices being connected individually to a set of single conductors connected via the multiplexing unit to the registers. A single transfer switching device responds to a control signal from the registers for disconnecting the originating ones of the pairs of indicating devices from the conductors and for connecting individually the terminating ones of the pairs of indicating devices to the respective conductors, thereby permitting the conductors to serve a dual purpose.

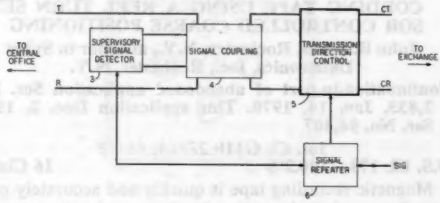


3,714,380

CONTROL ARRANGEMENT FOR DIRECTIONALIZING AUDIO TRANSMISSION

Robert Dean Berryman, Boulder, Colo., Donald Henry Erickson, Glen Rock, N.J., and Julio Cesar Raphel, Boulder, Colo.; said Erickson assignor to American Telephone and Telegraph Company, New York, N.Y., and said Berryman and said Raphel assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 11, 1971, Ser. No. 170,889
Int. Cl. H04m 7/14
U.S. Cl. 179—18 AH 9 Claims



An interface unit for coupling a central office to a branch exchange is disclosed. The unit includes a trans-

mission control device responsive to call conditions for establishing either unidirectional or bidirectional transmission therethrough.

3,714,381

NONINDUCTIVE ANTI-SIDETONE CIRCUIT

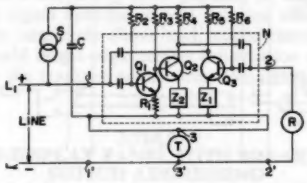
Ryoichi Matsuda and Masaaki Terai, Tokyo, Japan, assignors to Nippon Telegraph Public Corporation, Tokyo, Japan

Continuation-in-part of abandoned application Ser. No. 706,982, Feb. 20, 1968. This application Mar. 4, 1971, Ser. No. 120,919

Claims priority, application Japan, Feb. 25, 1967, 42/11,766

Int. Cl. H04m *1/58*

U.S. Cl. 179—81 A 7 Claims



This invention relates to anti-sidetone telephone circuits employing a non-reciprocal four-terminal network which does not utilize inductive elements such as hybrid transformers. Three sets of terminal pairs are formed from the four-terminal network and a terminal independent of the four-terminal network to which are respectively connected the transmitter, receiver and subscriber line. The four-terminal network includes two current sources; the first is connected between the output terminals of the network and its current output is generated as a function of the voltage applied to the input terminals of the network and a first control impedance determined from among the transmitter, receiver and the subscriber line impedances; the second current source is connected between the input terminals of the network and its current is generated as a function of the voltage applied to the output terminals of the network and a second control impedance determined from among the transmitter, receiver and the subscriber line impedances. The anti-sidetone circuit automatically effects sidetone attenuation and volume control of the transmitted signals.

3,714,382

METHOD AND SYSTEM FOR BIDIRECTIONAL SEARCH AND POSITIONING MAGNETIC RECORDING TAPE USING A REEL TURN SENSOR CONTROLLED COARSE POSITIONING

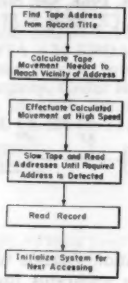
John R. Sykes, Rochester, N.Y., assignor to Sykes Datatronics, Inc., Rochester, N.Y.

Continuation-in-part of abandoned application Ser. No. 2,833, Jan. 14, 1970. This application Dec. 2, 1970, Ser. No. 94,407

Int. Cl. G11b *27/18, 15/18*

U.S. Cl. 179—100.2 S 16 Claims

Magnetic recording tape is quickly and accurately positioned at a selected location by the use of a turn counter to permit high speed advancement or rewinding of the tape to the vicinity of the desired location and the use of an address signal on the tape to indicate the exact location. A specific embodiment is described which uses a turn counter attached directly to either the supply or the take-up spindle in order to avoid cumulative error and to


Find Tape Address from Record Title
Calculate Tape Movement Needed to Reach Vicinity of Address
Effectuate Calculated Movement at High Speed
Slow Tape and Read Addresses Until Required Address is Detected
Read Record
Initialize System for Next Accessing

permit operation without the necessity of returning the tape to an initial reference position.

3,714,383

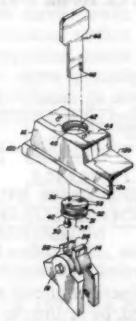
KEY OPERATED ELECTRIC CIRCUIT BREAKER

James H. Leonard, St. Louis, Mo., and Richard C. Quick, Cedar Rapids, Iowa, assignors to Square D Company, Park Ridge, Ill.

Filed Oct. 27, 1971, Ser. No. 192,902

Int. Cl. H01b *27/00*

U.S. Cl. 200—44 7 Claims



A movable contact arm of the circuit breaker is arranged to be moved selectively to ON and OFF positions by a key or tool which rotates an actuating member having an eccentric pin which actuates a driving member for the contact arm.

3,714,384

SUBSEA ELECTRIC CONNECTOR SYSTEM AND PROCEDURE FOR USE

Joseph A. Burkhardt, Chatsworth, and Thomas W. Childers, Woodland Hills, Calif., Danny R. Tidwell, Houston, Tex., and Roger J. Koerner, Santa Monica, Calif., assignors to Esso Production Research Company

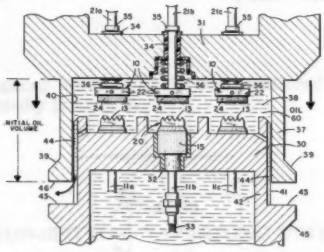
Filed Nov. 24, 1971, Ser. No. 201,635

Int. Cl. H01b *13/70*

U.S. Cl. 200—51 R 14 Claims

Method and apparatus for connecting and disconnecting replaceable electrically operated equipment to and

from, respectively, a source of electrical power, particularly at remote underwater locations. The electrical connection apparatus includes at least two connector units. Each connector unit comprises two halves capable of being repeatedly made up to and separated from each other. One-half includes a prong having metal spikes formed on one end and the other half includes a prong having a cup formed on one end containing a malleable metal. One-half of the connector unit is installed permanently subsea and is connected to switch means which is capable of controlling flow of electrical power from the electrical energy source to that half. The other half



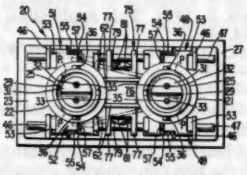
of the connector is movable and connected to electrically operated, replaceable equipment. An electrical connection is made when the prongs are locked together so that the spikes penetrate and are embedded in the malleable metal. The movable halves of the connector units are covered with a non-conductive liquid, such as oil, prior to making up the connection. As the connection is made up the oil forces water from about the permanently installed connector halves and when made up the connection is surrounded with oil. Means actuate the switch means to cut off electric power to the connection units before the connector halves can be disconnected.

3,714,385

MULTI-CONDUCTOR SWITCH FOR DEVELOPING PATCH FIELDS AND TEST BOARDS

Charles T. Leverich, Alexandria, Va., assignor to The Cooke Engineering Company, Alexandria, Va.

Filed Feb. 23, 1971, Ser. No. 117,938
Int. Cl. H01r *33/30, 33/34*
U.S. Cl. 200—51.1 **8 Claims**



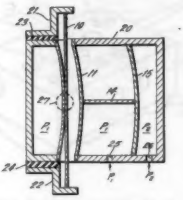
An electrical switch or jack assembly for use in developing patch fields and having multi-conductor twin-axial, two-pin polarized conductors normally interconnected through upper and lower self normalling contact rods, and parallel barrels the input ends of which are selectively formed or fitted to receive twin-axial two-pin polarized cable connectors or twin-axial concentric-tri-axial cable connectors and the output ends of which are formed to receive twin-axial two-pin polarized patch cord plugs. Universal cooperation to provide selective entry into conventional twin-axial cabled or tri-axial (concentric multiconductor) cabled source and load equipment is assurred by providing transition type adaptors for the equipment connected barrel ends and transition end fitted patch cords.

3,714,386

DIFFERENTIAL PRESSURE SWITCH USING ELONGATED TUBE AND SPACED INTERIOR WIRE

Frederick A. Gross, Upland, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed July 30, 1971, Ser. No. 167,681
Int. Cl. H01h *35/34*
U.S. Cl. 200—81 R **4 Claims**



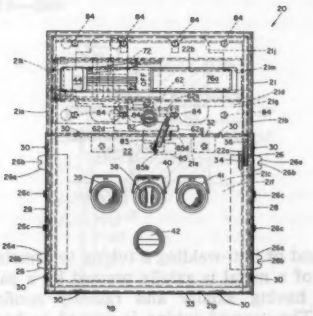
A taut conductive wire extends through the center of an elongated tube and is normally spaced from the inner walls of the tube. Central portions of the tube are connected to a diaphragm movable in response to variations in differential pressure and contact the taut wire after a predetermined movement. A plurality of elongated tubes and respective centrally located taut wires are also operated from the same source of motion.

3,714,387

SELECTIVELY MOUNTABLE MOTOR STARTER UNIT WITH REVERSIBLY POSITIONABLE CIRCUIT BREAKER OPERATING MECHANISM

Chester A. Bernier, Lexington, Ky., assignor to Square D Company, Park Ridge, Ill.

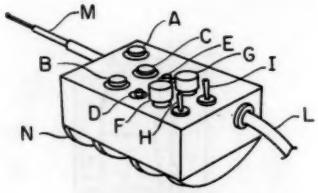
Filed Apr. 28, 1971, Ser. No. 138,101
Int. Cl. H01h *3/02*
U.S. Cl. 200—168 R **6 Claims**



A motor starter unit is mountable selectively on opposite sides of a stack of bus bars of an electrical panelboard and includes a reversibly positionable circuit breaker operating

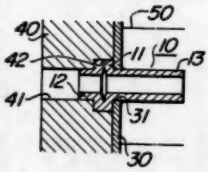
mechanism. Interlocks are provided to prevent opening of a cover of the motor starter unit when a handle of the operating mechanism is in ON position, unless an interlock-defeating screw is first turned, and to prevent movement of the handle to ON position when the cover is open.

3,714,388
DUAL SCREEN REMOTE CONTROLLER
Richard Ernest Evans, 35 Shady Vista Road, Rolling Hills Estates, Calif. 90274
Filed Dec. 2, 1971, Ser. No. 204,562
Int. Cl. H01h *9/02*
U.S. Cl. 200—168 R **4 Claims**



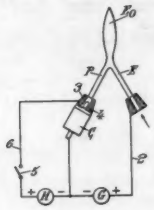
A plurality of thumb actuated switches can be positionally arranged on a hand held control box to provide both independent and simultaneous operation of the left and right hand elements of a dual screen projection system. Additionally, the control box is provided with a plastic finger grip and telescoping pointer.

3,714,389
METHOD OF BUTT-WELDING A TUBING TO A BASE METAL
Tanekatsu Torii, Anio, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Japan
Continuation-in-part of abandoned application Ser. No. 1,686, Jan. 9, 1970. This application Feb. 12, 1971, Ser. No. 114,886
Claims priority, application Japan, Feb. 19, 1969, 44/12,378; Mar. 25, 1970, 45/24,994
Int. Cl. B23k *9/02*
U.S. Cl. 219—104 **3 Claims**



A method of butt-welding a tubing to a metallic vessel. A tubing of a metal is axially pressed by a pair of mold members having axially and radially confined cavity portions. The pressed tubing is caused to have radially outward buckling deformation which the cavity portions cooperate to shape into a flange. Another piece of a metal is prepared and is formed therein with a recess. The three members are assembled together with said flange being received in said recess and sandwiched between the two other members. Thereafter, butt-welding is performed to simultaneously weld said flange to the two other members.

3,714,390
PROCESSES FOR PRODUCING PLASMA STREAMS WITHIN FLOWS OF FLUIDS
Marc Foex, Paris, and Robert Delmas and Claude Bonet, Montlouis, France, assignors to Agence Nationale de Valorisation de la Becherche (ANVAR), Pateaux, France
Filed Dec. 29, 1969, Ser. No. 888,508
Claims priority, application France, Dec. 31, 1968, 182,839
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 P **13 Claims**

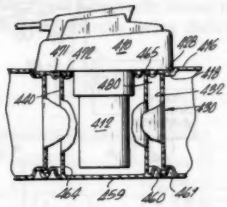


A process for producing plasmas which comprises nozzles delivering flows of fluid positioned such that said flows contact each other and electrodes respectively in contact with said flows. The electrodes are included in an electric circuit which is normally open and includes an external electric current supply source, the corresponding nozzle electrode for at least one of the flows being without an independent electrical supply. By sufficiently reducing the electric resistance within said flows and between the corresponding electrodes the electric circuit may be completed through said flows with the occurrence of electric arcs therein. This reduction of the resistance is preferably obtained by ionizing the atmosphere in which the flows are formed.

3,714,391
VAPORIZER WITH THERMALLY ISOLATED HEATING CHAMBER
Lawrence Katzman, New York, and Edward Briggin, Brooklyn, N.Y., assignors to Kaz Manufacturing Co., Inc., New York, N.Y.
Continuation-in-part of applications Ser. No. 884,911, Dec. 15, 1969, now Patent No. 3,610,879, and Ser. No. 113,543, Feb. 8, 1971. This application Sept. 28, 1971, Ser. No. 184,441
Int. Cl. A61m *15/00*; H05b *3/60*
U.S. Cl. 219—271 **5 Claims**

A heat insulating construction for a vaporizer comprising a vaporizer bowl having its bottom provided with at least one upstanding rib and a vaporizer head including a cap having a heating chamber depending therefrom and extending into the bowl and having a steam outlet in communication with the heating chamber. The heating chamber has an opening therein for receiving liquid from the vaporizer bowl. The vaporizer bowl has an opening for receiving the heating chamber. A cylindrical wall surrounds the heating chamber in non-contacting spaced relationship thereto and extends from the cap to engagement with the rib on the bottom of the bowl for lowering the temperature of the water in the bowl externally of the wall to substantially human body temperature in one

embodiment, the wall has an integral horizontal flange at its upper edge and a second wall integral with the bottom and spaced inwardly of the first mentioned wall extends upwardly thereof.



3,714,392

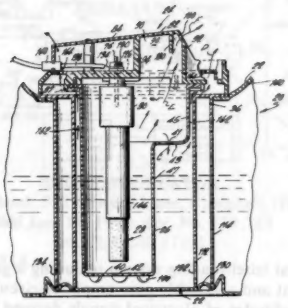
NON-SPITTING VAPORIZING UNIT

Lawrence Katzman, New York, and Edward Briggin, Brooklyn, N.Y., assignors to Kaz Manufacturing Co., Inc., New York, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,244

Int. Cl. H05b *3/60*; A61m *15/00*

U.S. Cl. 219—284 **9 Claims**



The heating chamber of a vaporizer is suspended from a cap seated in a concavity in the upper surface of a water container and has contained therein a pair of electrodes having at least a part of their upper portions covered with sleeves of insulating material. An insulating assembly carried by the cap surrounds the heating chamber in spaced relation thereto to form a vent space. The chamber has a water inlet opening and the cap has a steam outlet in the order of 3.8 times the size of the inlet opening. A normal steam outlet path communicates the outlet with the heating chamber. The heating chamber includes steam vent means communicating with the vent space. The cap has at least one aperture isolated from the normal steam outlet path and spaced from the steam outlet and communicating with said vent space so that excess steam produced under abnormal operating conditions can pass through the vent means to the vent space and thence out of the apertures.

3,714,393

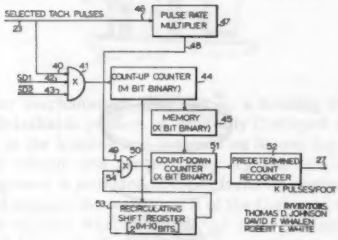
SYSTEM FOR PRODUCING A CONSTANT NUMBER OF PULSES PER UNIT LENGTH OF TRAVELING STRIP

Thomas D. Johnson, David F. Whalen, and Robert E. White, Roanoke, Va., assignors to General Electric Company

Filed July 20, 1971, Ser. No. 164,278

Int. Cl. G06m *7/00*

U.S. Cl. 235—92 DM **9 Claims**



A system for producing a constant number of pulses per unit length of a traveling strip passing a point. The constant number of pulses per unit length produced is independent of the tachometer selected, independent of the base frequency of the tachometer, and independent of variations in diameter of the roll in contact with the strip which generates the mechanical input to the tachometer. The system includes means easily adaptable to include factors which may be used to compensate for errors inherent in the process such as the shrinkage factor in the operation of a hot metal strip rolling mill which occurs upon the metal cooling to room temperature.

3,714,394

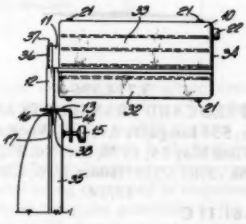
PORTABLE ELECTRIC OVEN

Walker Evans, Altadena, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 26, 1972, Ser. No. 220,931

Int. Cl. F24c *7/10*

U.S. Cl. 219—386 **3 Claims**



A portable electric oven, adaptable for mounting on an automobile door, with provisions for the insertion of trays

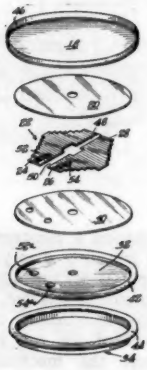
into the oven section, the upper portion of said oven section being removable to permit the lowest heating unit to serve as an open stove grate for frying or cooking purposes using conventional pots and pans.

3,714,395

ELECTRICAL HEATING UNIT

Matt N. Hummel, Glenview, Ill., assignor to Acra Electric Corporation, Schiller Park, Ill.

Filed Jan. 14, 1971, Ser. No. 106,325
Int. Cl. H05b *3/44, 3/50*
U.S. Cl. 219—544 **1 Claim**



The present invention relates generally to improvements in electrical heating units, and more particularly to improvements in electrical heating units of the type employing wafer-like material or sheets such as mica having an electrical heating coil associated therewith. The embodiment of the invention disclosed herein includes thin coplanar sheets of heat resistant, electrically non-conductive material such as mica, the outer peripheries of which in the aggregate generally define a circle. Diametral margins of said sheets are adjacently spaced and an electrical heating coil adjacently encircles said sheets. A terminal member is connected with each extremity of the coil, and suitable electrical insulating material adjacently superimposes opposite sides of the sheets. Means is provided for maintaining the sheets and insulating material in juxtaposition.

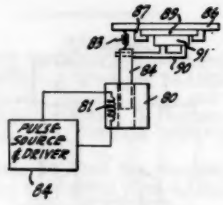
3,714,396

GRAVITY FEED CARD TRANSPORTS AND READERS

Leon Stambler, 534 Longacre Avenue, Woodmere, N.Y.

Filed May 15, 1970, Ser. No. 37,751
Int. Cl. G06k *13/07, 7/10*; H04m *1/26*; G07f *7/02*; G01d *15/14*
U.S. Cl. 235—61.11 C **8 Claims**

An inexpensive card transport or reader serves to move a credit card or other similar type card as an identification card or the like by means of gravitational forces along a path on a surface which may be inclined with respect to the horizontal plane. The card is alternately enabled and restrained from moving by a suitable selectively operated electromechanical assembly, such as a solenoid to enable sensing elements to respond to information printed on said card. The sensing ele-



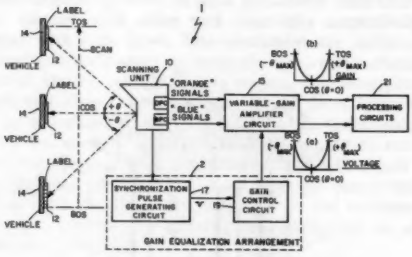
ments are used for converting the information into electrical signals having repetition rates determined by cycling means for activating the solenoid or electromechanical assembly.

3,714,397

INFORMATION PROCESSING SYSTEM

Frank G. Macey, Shrewsbury, and Robert H. Reif, Groton, both of Mass., assignors to GTE Information Systems and Sylvania Electric Products Inc.

Filed Nov. 12, 1970, Ser. No. 88,935
Int. Cl. G06k *7/12*
U.S. Cl. 235—61.11 E **15 Claims**



An optical label-reading system including a gain equalizing arrangement and a variable-gain amplifier circuit for equalizing the amplitudes of electrical signals derived by an optical scanning apparatus from coded retroreflective labels affixed to railway vehicles at varying vertical heights within a wide range of vertical heights.

3,714,398

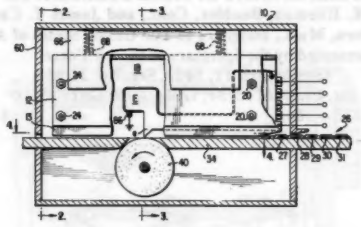
ELECTRO-MECHANICAL READ HEAD

Allen J. Brock, Atlanta, Ga., assignor to Data Card Corporation, Minneapolis, Minn.

Filed March 26, 1971, Ser. No. 128,379
Int. Cl. G06k *7/015, 7/04, 7/10*
U.S. Cl. 235—61.11 C **9 Claims**

An electromechanical read head includes a plurality of juxtaposed scanning the card, for scanning raised or embossed characters, such as the embossed characters of a credit card. The juxtaposed elements are mounted between parallel side walls of the head and are free to move independently of each other. The walls extend downwardly and define a channel therebetween for receiving therebetween a line of embossed

characters, the walls physically engaging the upper and lower extremes of the embossed characters. The path of travel of the card through the scan head, and thus the scan path of each scanning element, is thereby defined. Each of the scanning elements comprises an arm of resilient material including a scanning tip or wiper which is normally biased toward the surface of the card the arm thereby being deflected upwardly



when the tip is raised upon engaging a segment of a character in its scan path. Electrical switching means associated with each element respond to the deflection thereof to produce an electrical output signal corresponding to the mechanical scanning of segments of the character in the corresponding scan path. The plural, simultaneously produced output signals are then processed for character recognition.

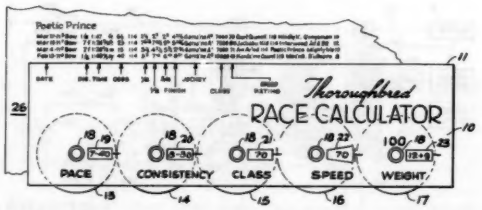
ERRATUM

For Class 235—092 see:
Patent No. 3,714,393

3,714,399
RACE CALCULATOR

James A. Cataland, 558 Edward Lane, Campbell, Ohio

Filed Jan. 21, 1972, Ser. No. 219,745
Int. Cl. G04b 17/06
U.S. Cl. 235—114 4 Claims

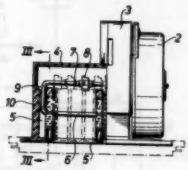


A race calculator for selecting a race horse in a horse race, the calculator consisting of a series of predictor dials each of which can be set to represent points as determined from the horses performance in previous races and with respect to pace, consistency, class, speed and weight; each dial giving a numerical figure result; addition of the points on the several dials produces a point rating. Comparison of the point ratings thus obtained indicates the likely contenders in a race.

3,714,400
COUNTING MECHANISMS

Rolf Laven, Nasby Alle 21 B, Taby, Sweden

Filed Feb. 28, 1972, Ser. No. 229,921
Claims priority, application Sweden, March 4, 1971, 2800/71
Int. Cl. G06c 27/00
U.S. Cl. 235—117 R 4 Claims

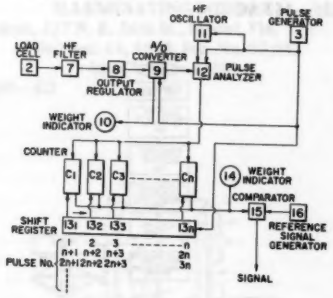


A counter mechanism is disposed in a housing having a main and detachable portion. A generally U-shaped member is disposed in the housing and supports on its one leg a series of numeral wheels and on its other leg the ters transfer pinions. A groove is provided in the detachable portion of the housing and engages the web portion of the U-shaped member to urge the counter wheels toward the main portion of the housing and to locate the wheels in the correct operational position relative to a counter actuating mechanism.

3,714,401
CONVEYOR TYPE CONTINUOUS WEIGHING SYSTEM

Yoshio Yano, Kitakyushu, Japan, assignor to Kabushiki Kaisha Imamura Seisakusho, Kitakyushu, Japan

Filed Sept. 27, 1971, Ser. No. 183,753
Int. Cl. G06f 15/46; G01g 11/14
U.S. Cl. 235—151.33 4 Claims

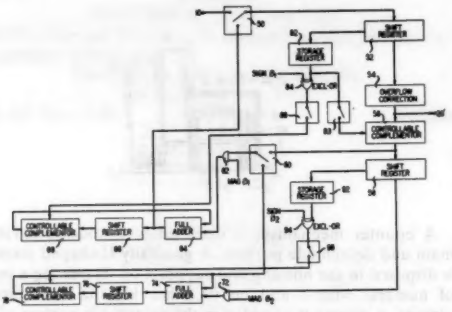


A conveyor type continuous weighing system having a weighing conveyor, a pulse generator, a high-frequency oscillator, a plurality of counters, a shift register, an integrated weight indicator and a comparator. In the system, the counters count the number of high-frequency pulses representing the weight of a material being conveyed in response to the application of pulses from the pulse generator to the shift register, and the new count is added to the previous count. The sum of the weight of the material having been discharged from the weighing conveyor and the weight of the material existing on the weighing conveyor is compared with a predetermined setting, and the supply of the material is stopped when the sum attains the predetermined setting.

3,714,402
DIGITAL FILTER EMPLOYING SERIAL ARITHMETIC

Milton Baumwolspiner, Brooklyn, N.Y., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Dec. 20, 1971, Ser. No. 209,984
Int. Cl. G06f 7/38, 1/02, 15/34
U.S. Cl. 235—152 12 Claims

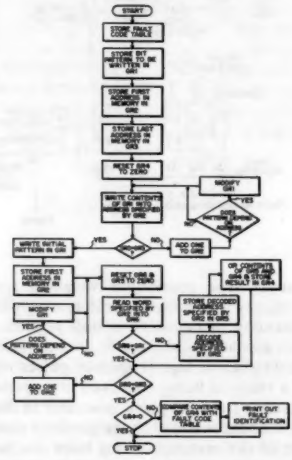


Second-order digital filtering apparatus requiring a relatively small number of components and therefore suitable for fabrication as a small number of integrated circuits. The filter is simplified by a novel organization and by the use of serial arithmetic throughout.

3,714,403
COMPUTER IMPLEMENTED METHOD OF DETECTING AND ISOLATING ELECTRICAL FAULTS IN CORE MEMORY SYSTEMS

Robert W. Ammann, Lisle; James R. Creasy, Lombard, and David O. Dorenbos, Park Ridge, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 1, 1971, Ser. No. 176,956
Int. Cl. G11c 29/00; G06f 11/00
U.S. Cl. 235—153 AC 5 Claims

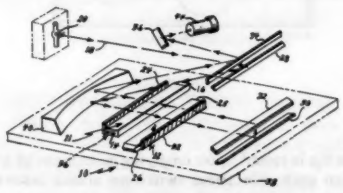


A computer implemented method of detecting and isolating both permanent and intermittent electrical failures in core memory systems is based upon a unique code number associated with each potential failure and derived from the symmetry of the relationship among the memory components for any selected word. The address of each failing memory word is decoded and all of the decoded address fields are OR'ed, on a bit by bit basis to provide a code number indicative of a combination of word failures which is correlated to the specific component failure.

3,714,404
BIREFRINGENT OPTICAL CORRELATOR

Ronald E. Hileman, Boulder, Colo., and James T. Campbell, Sherborn, Mass., assignors to The United States of America as represented by the Secretary of the Air Force

Filed March 11, 1970, Ser. No. 24,936
Int. Cl. G06f 15/34; G06g 7/19; G01r 23/16
U.S. Cl. 235—181 5 Claims

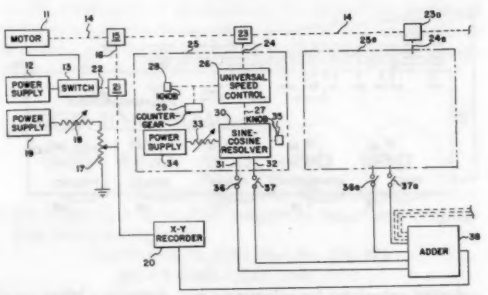


A birefringent optical correlator having a light source, a pair of ultrasonic delay lines and a photosensitive device. The birefringent optical correlator does not contain apertures or polarizers between the delay lines and therefore passes the entire image therethrough. A polarizer is located before the first delay line and after the second delay line in order to separate the modulated or diffracted light. Thus, the birefringent optical correlator requires substantially little source light intensity and mechanical alignment.

3,714,405
FUNCTION GENERATOR FOR SYNTHESIZING COMPLEX VIBRATION MODE PATTERNS

Eugene C. Naumann and Gideon J. Hagood, Jr., Newport News, Va., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed May 26, 1971, Ser. No. 147,103
Int. Cl. G06g 7/22, 7/26
U.S. Cl. 235—197 9 Claims



A simple highly flexible device for synthesizing complex vibration mode patterns. These mode patterns can be used to identify vibration mode data. This device sums selected sine and cosine functions and then plots the sum against a linear function.

3,714,406

SEALED HOUSINGS FOR ELECTRONIC OR ELECTRICAL EQUIPMENT

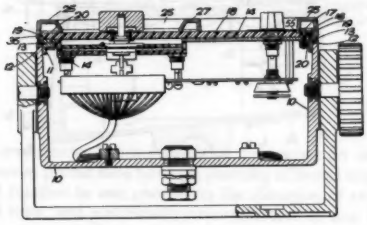
Roderick Hope Clarke, London, England, assignor to Decca Limited, London, England

Filed Feb. 26, 1971, Ser. No. 119,130

Claims priority, application Great Britain, April 9, 1970, 17,018/70

Int. Cl. G01d 11/28

U.S. Cl. 240—1 EL 1 Claim



A sealed housing for electronic or electrical equipment has a clamping plate sealed by a resilient seal to a main case portion and an outer plate or trim member to cover the heads of the fixing screws. The trim member has protruding from its underside fixing pins which are gripped by resilient blind sockets sealed into the clamping plate. The clamping plate is partly formed of transparent material so that dials etc. can be seen. Edge-illumination of the transparent portion of the clamping plate is provided by lamp bulbs mounted in sockets sealed into the clamping plate. The lamp bulbs, hidden by the trim member, lie in apertures in the transparent portion, thus bulb replacement can be effected without opening the sealed housing.

3,714,407

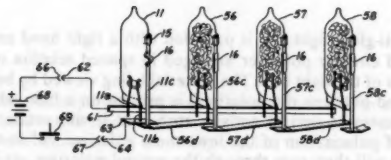
PHOTOFLASH LAMP ARRANGEMENT HAVING THERMALLY ACTUATED CONTROL

Harry J. Bowers, Jr., Mayfield Heights, Ohio, assignor to General Electric Company

Filed March 15, 1971, Ser. No. 124,379

Int. Cl. G03b 15/03

U.S. Cl. 240—1.3 14 Claims



In an arrangement of photoflash lamps, one or more of the lamps has a heat-deformable plastic control pin positioned adjacent thereto so as to become deformable due to heat generated when the lamp is flashed. The control pins are provided with specially shaped deformation zones, blackened if desired, to more readily absorb heat and become deformed when the associated lamp is flashed. The control pins are spring-loaded by a mechanism for controlling a function such as switching of electrical connections from one lamp to another as they become flashed, or for actuating indicator means for indicating whether a lamp has been flashed.

3,714,408

MULTIPLE FLASH BULB DEVICE

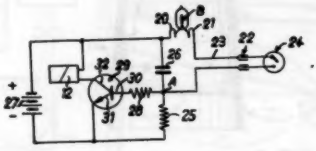
Adeline Von Gunten, Murten, and Gabriel Schwarzkopf, Biel, both of Switzerland, assignors to Fotostudio Von Gunten & Senn, Murten, Freiburg, Switzerland

Filed April 26, 1971, Ser. No. 137,512

Claims priority, application Switzerland, April 30, 1970, 6571/70

Int. Cl. G03b 15/02; H05b 41/02

U.S. Cl. 240—1.3 9 Claims



A multiple flash bulb device embodying a number of flash bulbs which can be individually connected through the agency of a stepping mechanism with a voltage source incorporating a capacitor which can be charged via a charging resistor, and wherein the flash bulbs can be ignited by a flash contact. An actuation magnet is operatively associated with the stepping mechanism, the power for operating the actuation magnet being furnished by the supply source and the actuation magnet can be connected into the circuit via the flash contact. An electrical valve is connected in series with the actuation magnet, this electrical valve can be brought into a conductive state through the agency of a time-delay element which can be activated by the flash contact.

3,714,409

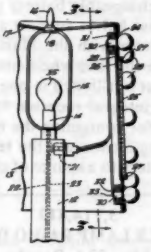
LAMP WITH COMBINATION LAMP SHADE AND ILLUMINATING MIRROR

Aime Trudeau, 227 N. E. 26th St., Miami, Fla.

Filed Dec. 14, 1970, Ser. No. 97,847

Int. Cl. F21v 33/00

U.S. Cl. 240—4.2 2 Claims



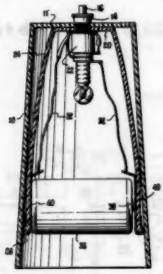
A standing table or floor lamp having a combination lamp shade and mirror is described, including a mirror fixed against an outer face portion of the shade and a plurality of auxiliary electrical lamps surrounding the mirror and supported by the shade for illuminating the mirror and the face of a person observing his image in the mirror.

3,714,410

SERVICE LIGHT FOR DINING TABLES

Leslie E. Olsen, 1894 Locust Street, Reno, Nev.

Filed March 14, 1972, Ser. No. 234,575
Int. Cl. F21v *1/00*
U.S. Cl. 240—6.4 R **7 Claims**



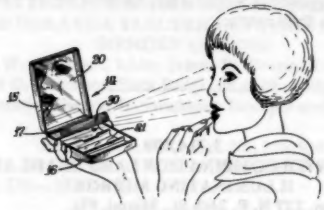
A light for attracting the attention of a waiter in a dining room is composed of a transparent globe containing a light switch and bulb within the globe, and an electric battery held in a frame hung from said light switch.

3,714,411

ILLUMINATED MAKEUP MIRROR

Robert S. Waters, Lancaster, Pa., and Albert R. Spohr, Park Ridge, Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed April 8, 1971, Ser. No. 132,308
Int. Cl. A45c *15/06*
U.S. Cl. 240—6.45 **6 Claims**



An illuminated makeup mirror including a flat compact casing which is provided with hinged housing halves permitting the casing to be opened to expose a makeup mirror. Mounted within the casing is a movable illuminating means which consists of a pivotal bulb carrier supporting a row of bulbs which are powered by a rechargeable battery positioned within the case. The separate case halves support a conventional mirror and a magnifying mirror with the illuminating means being movable to illuminate the face when either of the mirrors are used. A frame member positioned in one of the housing members is formed with integral recesses for receiving the illuminating means and for containing the battery, the switching means for illuminating means and the terminal means for interconnecting the battery to a source of charging power.

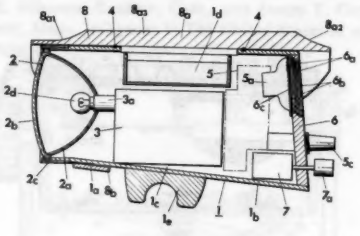
3,714,412

BICYCLE LAMP RADIO DEVICE

Lester Kenneth Franklin, 23A Repulse Bay Rd., Apt. 10A, Hong Kong

Filed July 29, 1970, Ser. No. 59,299
Claims priority, application Japan, March 10, 1969, 44/20715
Int. Cl. B62j *5/00*
U.S. Cl. 240—7.55 **3 Claims**

This invention discloses a bicycle lamp radio device which comprises a body formed in tapered cylindrical shape and incorporating therein a cell box for encasing a dry cell inside, a lamp unit and a radio set, said lamp unit and said radio set being positioned opposite each other; and a partly-cut-out-cylindrical outer case having an inner wall which exactly fits to the periphery of said body thereby to cover water-tightly an opening for replacing the dry cell formed in the upper wall of said body. The possible trouble and corrosion of the electric



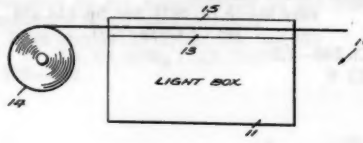
unit can be completely avoided. In addition, the outer case can be easily attached to and detached from the body, whereby replacement of a dry cell can be easily and rapidly made. The thus constructed bicycle lamp radio device according to the present invention can serve both as a bicycle lamp at night driving and a radio receiver for listening to broadcasting when desired, is simple in structure and can be manufactured at reasonable cost.

3,714,413

ANTI-GLARE LIGHT BOX

Dwin R. Craig, Gaithersburg, Md., assignor to Dynatronics, Inc., Washington, D.C.

Continuation-in-part of Ser. No. 805,693, March 10, 1969, Pat. No. 3,621,231. This application Nov. 15, 1971, Ser. No. 198,533
Int. Cl. F21u *9/00*
U.S. Cl. 240—9.5 **3 Claims**



An anti-glare light box is provided with a right hand and a left hand circular polarizer arranged in spaced relation over the lights of the light box. The material being viewed by being positioned between the polarizers is printed on a base which either possesses optical activity such that it will rotate the planes of polarization of the lowermost polarizer 90° so that the light will then pass through the second polarizer, or is a depolarizer and depolarizes the light from the first polarizing screen so that it can pass through the second polarizing screen.

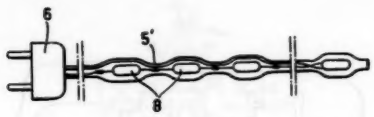
ERRATUM

For Class 240—67 see:
Patent No. 3,714,418

3,714,414
ORNAMENTAL LIGHTING MEANS

Alf Tommy Sternius, Lidingo, Sweden, assignor to Kommanditbolaget T. Sternius Akhegvlag & Co., Stockholm, Sweden

Filed Feb. 9, 1971, Ser. No. 114,024
Int. Cl. F21p *1/02*; F21s *3/00*
U.S. Cl. 240—10 R 4 Claims

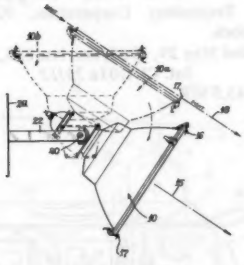


An ornamental lighting structure comprises an elongated transparent plastic tube having a plurality of lamps disposed in spaced relation to one another in the direction of elongation of said tube, and electrically interconnected to one another, and to an electrical plug disposed at one end of the tube, in a series circuit. The tube is hermetically sealed about the lamps, and is constricted at spaced locations along the direction of elongation of the tube, at positions between the spaced lamps respectively, to enhance the ornamental effect of the lighting structure.

3,714,415
DIRECTIONAL MOUNTING FOR AREA LIGHTING

Allan P. Stephensen, Chicago, Ill., assignor to Appleton Electric Company, Chicago, Ill.

Filed June 14, 1971, Ser. No. 152,624
Int. Cl. F21v *19/02*
U.S. Cl. 240—44.26 7 Claims



A flood lamp has trunnions which are journaled in a mounting bracket. Detents on the trunnions cooperate with two spaced sockets on the mounting bracket to releasably hold the lamp in two alternative positions about the trunnion axis, which positions are spaced ninety degrees apart. On the lamp housing are sights which define a line of sight for aiming purposes, which line of sight intersects the axis of illumination at 90°.

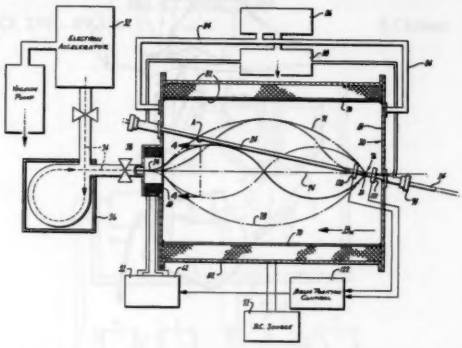
ERRATUM

For Class 246—63 see:
Patent No. 3,714,419

3,714,416
METHOD AND APPARATUS FOR IRRADIATION TREATMENT OF ELONGATE MATERIALS

William T. Link, and G. Laurie Hatch, both of Berkeley, Calif., assignors to Applied Radiation Corporation, Walnut Creek, Calif.

Filed Feb. 24, 1969, Ser. No. 824,016
Int. Cl. H01j *37/00*
U.S. Cl. 250—49.5 TE 6 Claims

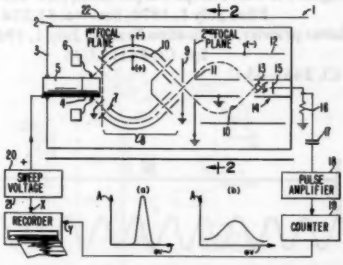


An irradiation method and apparatus in which an electron beam is diverted along a path which is caused to rotate about the beam axis and to intersect and sweep about a cone directed through the target to be irradiated and to thereby enter the target at an oblique angle. Apparatus is disclosed for causing the beam to take a rotating helical path and for passing the target through the imaginary apex of the cone shaped irradiation pattern of said rotating beam. Other apparatus is disclosed for coaxial irradiation from within hollow tubular targets and is particularly adapted for the irradiation of plastic tubing at the time of extrusion.

3,714,417
BEAM FOCUS COILS FOR INDUCED EMISSION APPARATUS

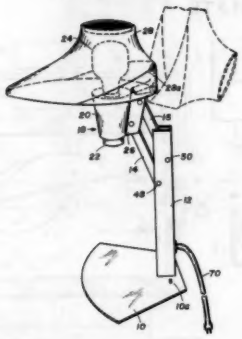
Weston A. Anderson, Palo Alto, and John C. Helmer, Menlo Park, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed April 30, 1970, Ser. No. 33,321
Int. Cl. G01n *23/22*
U.S. Cl. 250—49.5 AE 9 Claims



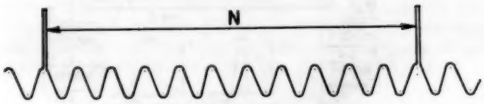
An induced electron emission spectrometer is disclosed. The spectrometer bombards a sample surface to be analyzed with radiation to induce emission of a hollow cylindrical electron beam which is analyzed and focused to a detector. A set of beam focus coils derived from an orthogonal expansion of the magnetic potential in the beam path are coaxially disposed of the beam path and energized with current to produce one or more magnetic field components within the beam path for shifting the position or changing the shape of the beam to correct for misalignment or aberrations of the beam.

3,714,418
LAMP ASSEMBLY
J. Larry Stephans, 2080 Redding Rd., Cambria Heights, N.Y.
Filed Oct. 15, 1970, Ser. No. 81,081
Int. Cl. F21v 21/14
U.S. Cl. 240—67 21 Claims



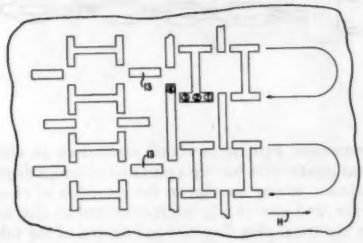
A desk lamp having an upright columnar member secured at one end to a base and on which a pair of parallel arms for supporting an incandescent light bulb housing and reflector are pivotally mounted. The combined weight of the lamp, reflector and supporting arms is counterbalanced by a spring contained within the column, and the parallel arms permit vertical adjustment of the lamp over a range of heights. The socket for the bulb is contained within a cup which also houses a dimmer circuit, the control for which depends from the bottom of the cup. A reflector secured to the cup is shaped and positioned relative to the bulb so as to intercept and deflect light downwardly and forwardly over a generally semi-circular area in front of the base. The combination of vertical adjustibility, light intensity control and reflector shape provides a wide range of light intensity over a working zone of adjustable area.

3,714,419
SYSTEM FOR THE TRANSMISSION OF INFORMATION TO A VEHICLE ON RAILS
Jacques Andre Charles Fosse, 92 Chatillon-sous-Bagneux, and Joel Albert Pelletier, Issy-les-Moulineaux 92, both of France, assignors to U.S. Philips Corporation, New York, N.Y.
Filed July 1, 1970, Ser. No. 51,574
Claims priority, application France, July 1, 1969, 6922194
Int. Cl. B61l 23/16
U.S. Cl. 246—63 C 6 Claims



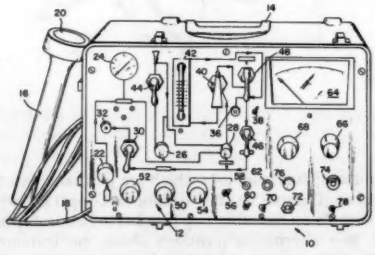
A system for transmitting additional information throughout a railroad communication system that uses unmodulated signals representing signalling information transmitted through the rails by superimposing pulses having pulse repetition periods representing additional information on the unmodulated signals. A vehicle is provided with means for picking up the signals from the rails, decoding the pulse signals and displaying the additional information.

3,714,420
MAGNETIC DEVICES IRRADIATED BY PENETRATING ELECTROMAGNETIC RADIATION
Peter Michael Eisenberger, Morristown, and Paul Herman Schmidt, Chatham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 9, 1970, Ser. No. 96,309
Int. Cl. G01n 23/00; H01j 37/00
U.S. Cl. 250—42 1 Claim



The velocity of propagation at a constant applied field of small enclosed magnetic domains of polarization opposite to that of the immediately surrounding material is increased by irradiating the material with X-rays for a short period of time. By so enhancing the velocity of propagation of these magnetic domains, the functions of switching, memory logic, etc., are thereby performed at a faster rate.

3,714,421
GAS DETECTOR AND ANALYZER
Conrad S. Josias; Lloyd D. Bowman, both of Los Angeles, Calif., and James E. Lovelock, Wilts, England, assignors to Analog Technology Corporation, Pasadena, Calif., by said Lovelock
Filed May 29, 1969, Ser. No. 835,290
Int. Cl. G01n 23/12
U.S. Cl. 250—43.5 MR 10 Claims



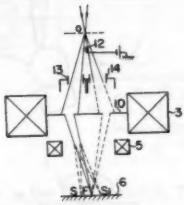
A portable, self-contained gas detector and analyzer is disclosed which includes a carrier gas supply, and electrical power supply, a sampling loop and a chromatographic column with an electron-capture detector. A preferred embodiment is adapted to respond to a pre-selected tracer gas. If the tracer is included in a closed system whose integrity is suspect, the detector can first be operated to detect the presence of the tracer and then can signal the rate at which the tracer is being provided to a predetermined, limited volume.

3,714,422

SCANNING STEREOSCOPIC ELECTRON MICROSCOPE

Shigeyuki Hosoki; Hiroshi Okano, and Kazuaki Kamijo, all of Tokyo, Japan, assignors to Hitachi Limited, Tokyo-to, Japan

Filed April 6, 1970, Ser. No. 25,656
Int. Cl. H01j 37/26; G01n 23/04
U.S. Cl. 250—49.5 A 8 Claims



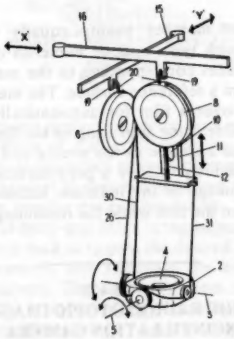
A charged particle beam apparatus provided with an adjusting device to change an impinging angle of charged particle beams to be irradiated onto a specimen, thereby enabling a stereo-image thereof without tilting the same.

3,714,423

SPECIMEN STAGES FOR ELECTRON MICROSCOPES

Jeffrey H. Lucas, Rickling, near Saffron Walden, Essex, England, assignor to Associated Electric Industires Limited, London, England

Filed May 21, 1971, Ser. No. 145,694
Claims priority, application Great Britain, May 22, 1970, 24,916/70
Int. Cl. H01j 37/26
U.S. Cl. 250—49.5 B 21 Claims



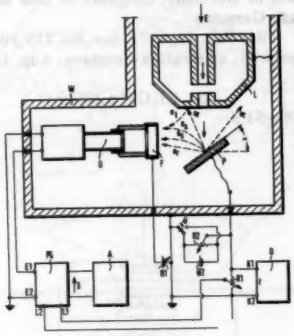
A specimen stage for an electron microscope having a wire-driven gimbal assembly. The assembly is so designed that there is no interaction between the tilting of the inner and outer gimbals. The drive for the gimbals comprises two wires, each of which is attached at one end to a drive pulley and at its outer end, after passing around a guide pulley pivoted about the outer gimbal axis, is coupled to the inner gimbal. Thus, when the outer gimbal is tilted, the wires wind on to or off of the guide pulleys, causing the drive pulley to move towards or away from the gimbals, but with substantially no tilting of the inner gimbal.

3,714,424

APPARATUS FOR IMPROVING THE SIGNAL INFORMATION IN THE EXAMINATION OF SAMPLES BY SCANNING ELECTRON MICROSCOPY OR ELECTRON PROBE MICROANALYSIS

Ulrich Weber, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed March 10, 1971, Ser. No. 122,785
Claims priority, application Germany, March 10, 1970, P 20 11 193.7
Int. Cl. H01j 37/26
U.S. Cl. 250—49.5 A 8 Claims



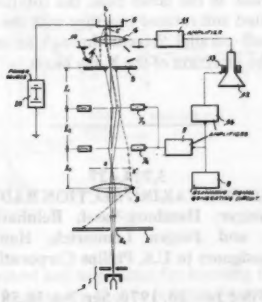
In the analysis of a sample bombarded by a scanning primary electron beam, in order to ensure that only low-energy electrons emitted by the sample contribute to the image formation in an evaluating apparatus, adjacent the sample face an alternating electric or magnetic field is generated which periodically weakens the current of electrons emitted by the sample so that a modulated electron flow reaches a secondary electron detector disposed in the vicinity of the sample.

3,714,425

REFLECTING MIRROR TYPE ELECTRON MICROSCOPE

Teruo Someya, 3414 Haijima-machi, Akishima-shi, Tokyo, and Higekata Sakural, No. 31 2-chome-17 Kichijoji, Higashi-machi, Musashino-shi, Tokyo, both of Japan

Filed Feb. 5, 1971, Ser. No. 112,878
Claims priority, application Japan, Feb. 7, 1970, 45/10813; March 30, 1970, 45/26777
Int. Cl. H01j 37/26; G01n 23/22
U.S. Cl. 250—49.5 A 9 Claims



A reflecting mirror type electron microscope in which a specimen maintained at a high negative potential is scanned by an electron beam focused in the vicinity of the specimen

surface. A bright specimen surface image is produced by the electrons reflected by the electric field formed in front of the specimen without reducing the field of view.

3,714,426

METHOD OF X-RAY ANALYSIS OF CRYSTAL STRUCTURE AN X-RAY GONIOMETER FOR CARRYING OUT SAID METHOD

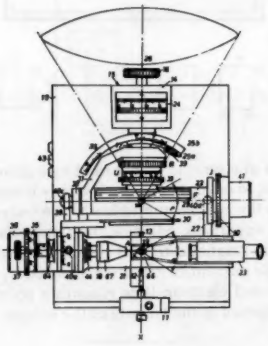
Erich R. Wolfel, Darmstadt, and Richard H. Wendel, Reinheim, both of Germany, assignors to Stoe & Cie, GmbH, Darmstadt, Germany

Filed Feb. 26, 1971, Ser. No. 119,102

Claims priority, application Germany, Aug. 18, 1970, P 20 41 031.5

Int. Cl. G01n *23/20*

U.S. Cl. 250—51.5 **25 Claims**



A method and apparatus of photographing the reciprocal crystal lattice in the structural analysis of crystals by means of sharply concentrated monochromatic X-rays, using an X-ray goniometer having a rotatably mounted crystal and a film which can, if necessary, be rotated in its plane and in front of which a shutter is arranged. The film is supported parallel to the rotational axis of the crystal for producing diffraction images in accordance with the Buerger procession principle and in a normal position relative to the rotational axis for producing diffraction images in accordance with the de-Jong-Bouman method. In the latter case, the rotational axis of the crystal is pivoted and rotated together with the rotational axis of the film and parallel thereto through an angle of at the most, 45° to the direction of the X-ray beam.

3,714,427

APPARATUS FOR TAKING SECTION RADIOGRAPHS

Friedrich Reiniger, Hamburg-Sasel; Reinhard von Hacht, Halstenbek, and Jurgen Lemmrich, Hamburg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

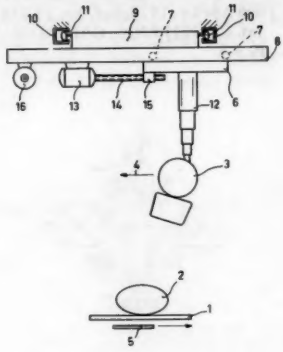
Filed July 20, 1970, Ser. No. 56,581

Claims priority, application Germany, July 19, 1969, P 19 36 915.4

Int. Cl. G01n *21/00*; H01j *37/00*

U.S. Cl. 250—61.5 **13 Claims**

An apparatus for taking section radiographs with the x-ray tube being movable in two mutually perpendicular directions simultaneously by two separate electric motors. The speeds of the motors are independently variable so that the tube's movement can describe any desired path including an ellipse, while the x-ray source is also adjustable.



3,714,428

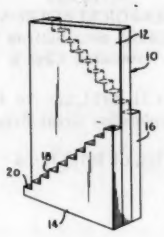
MARKER FOR RADIOLOGY

Vincent T. Gasaway, 915 S. Lafayette, Chanute, Kans.

Filed Aug. 10, 1970, Ser. No. 62,277

Int. Cl. G01b *15/00*

U.S. Cl. 250—59 **6 Claims**



A radiolucent member having equally spaced sloping, stepped edges with radio-opaque numerals on the upwardly facing step surfaces corresponding to the measured distance of each step from a reference surface. The member is adapted for positioning over a film for automatically recording the height of the visible plane appearing on the film when exposed to radiation from a source as the source and film carrier are moved simultaneously relative a predetermined line lying in the plane. The image of the indicium located closest to the plane is visible on the film while the remaining indicia are obscured.

3,714,429

TOMOGRAPHIC RADIOISOTOPIC IMAGING WITH A SCINTILLATION CAMERA

John G. McAfee, The Carriage House, East Seneca Turnpike, Manlius, N.Y.; James M. Mozley, 126 Windcrest Drive, Camillus, N.Y., and Edward P. Stabler, 206 Crestwood Drive, Syracuse, N.Y.

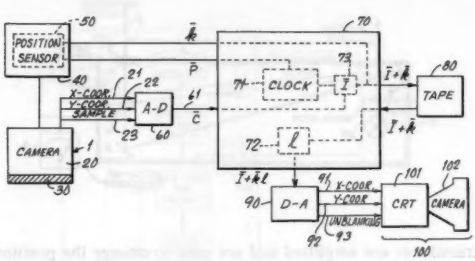
Filed Sept. 28, 1970, Ser. No. 75,827

Int. Cl. G01n *23/00*; G01t *1/20*

U.S. Cl. 250—61.5 **14 Claims**

A method and means for tomographic imaging involving the use of a radioisotopic detector comprising a scintillation camera with a multichannel parallel-hole collimator, whose holes are all inclined at an identical angle toward the field of interest, and the moving of this detector in a series of back-and-forth linear motions, centered on a common axis of rota-

tion and with the collimator in reversed orientations, in such manner that the accumulated count rate information can be computed, stored, retrieved and selectively integrated to produce a tomographic image of the radioactive distribution



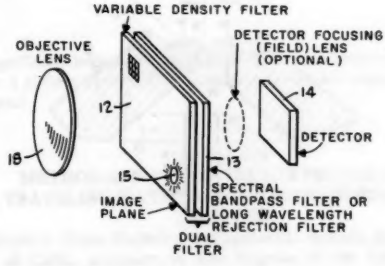
in any selected plane in the field scanned. The count rate information is collected and computed in terms of a fixed coordinate system and provides a reservoir of computed data which may be analyzed, utilizing a time-lapse summation technique, to present any particular tomographic plane for imaging.

3,714,430

PHOTOELEMENT INTENSE RADIATION PROTECTIVE DEVICE

Rodger C. Finvold, and Charles M. Davis, both of San Diego, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed May 19, 1967, Ser. No. 642,650
Int. Cl. G02f 1/28; G02b 5/22
U.S. Cl. 250—83.3 H **3 Claims**



An optical detector protective device for a radiation detecting system consisting of a filter of direct-band-gap emitting semiconductor material, which has an extremely steep absorption edge as compared to indirect band gap materials and a spectral filter for passing desired bandwidth. The absorption edge of the direct-band-gap filter being adjacent its emitting line and positioned such as to pass the desired emission line at ordinary temperatures and attenuate the emission line at elevated temperatures. The device prevents deterioration of the detector in the presence of high intensity light sources in cases where monochromatic or near monochromatic light is employed. The absorption coefficient of the device varies greatly with temperature and wave length.

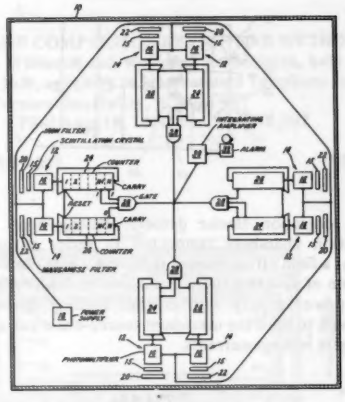
3,714,431

SOLAR FLARE WARNING DEVICE

Andrew A. Sterk, Berwyn, Pa., assignor to General Electric Company

Filed June 11, 1970, Ser. No. 45,360
Int. Cl. G01t 1/16, 1/20
U.S. Cl. 250—83.3 R **1 Claim**

Solar flares, which produce radiation potentially dangerous in space or at high altitudes in the upper portions of the earth's atmosphere, are signalled initially by the appearance of radiation at about 1.8 Angstroms, which precedes by a substantial fraction of an hour the increase in intensity of the flare to dangerous levels. A device selectively sensitive to radiation of this wavelength is connected to an alarm device whose operation gives sufficient warning to permit space travelers to seek



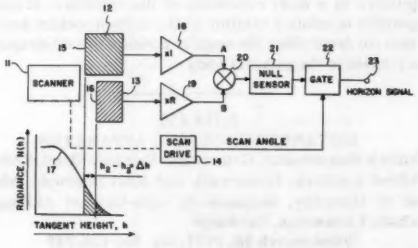
shelter within protective shield before the radiation reaches dangerous levels, or alternatively gives aircraft flying at high altitudes warning in adequate time for them to descend to altitudes of about 50,000 feet or less, at which altitude the absorption by the atmosphere above that level is adequate protection.

3,714,432

INFRARED HORIZON LOCATOR

Antony Jalink, Jr., Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed May 26, 1971, Ser. No. 146,935
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 H **10 Claims**



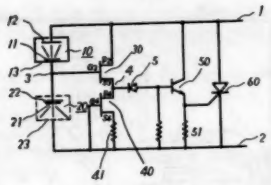
A precise method and apparatus for locating the earth's infrared horizon from space that is independent of season and latitude. First and second integrations of the earth's radiance profile are made from space to earth with the second delayed with respect to the first. The second integration is multiplied by a predetermined constant R and then compared with the first integration. When the two are equal the horizon is located.

3,714,433

IONIZATION SMOKE DETECTOR

Akihiro Kobayashi, Fujisawa-shi, Kanagawa-ken, Japan, assignor to Nittan Company Limited, Tokyo, Japan

Filed Sept. 28, 1970, Ser. No. 76,042
Int. Cl. G01t 1/18
U.S. Cl. 250—83.6 FT 2 Claims



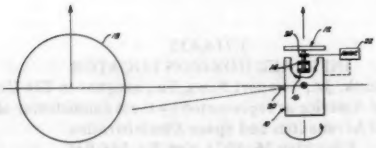
An ionization smoke detector having open and closed ionization chambers connected in series across a power supply, a field effect transistor having a gate connected to the junction of said chambers and a source-drain path connected to a power supply with current limiting means in series therewith to limit the maximum source-drain current resulting from gate leakage currents.

3,714,434

DESPIN CONTROL SYSTEM FOR A MULTISPIN STABILIZED DEVICE

Carleton M. Mears, Jr., Las Alamitos, and Paul W. Oberle, Placentia, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 657,393, July 31, 1967, abandoned.
This application Jan. 29, 1971, Ser. No. 111,127
Int. Cl. G01j 1/02, 1/20
U.S. Cl. 250—83.3 H 11 Claims



A stabilized device comprising a rotatably coupled despun section and rotor section including a control having sensors responsive to a body externally of the stabilized device and responsive to relative rotation of the despun section and rotor section for controlling the angular position of said despun section relative to the external body.

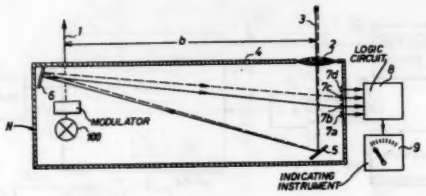
3,714,435

DISTANCE MEASURING APPARATUS

Friedrich Bestenreiner, Gruenwald; Reinhold Deml, 8 Munich; Alfred Kubitzek, Gruenwald, and Kurt Borowski, Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed March 18, 1971, Ser. No. 125,737
Claims priority, application Germany, March 19, 1970, P 20 12 995.7
Int. Cl. G01s 9/64
U.S. Cl. 250—83.3 H 10 Claims

A base range finder wherein a projector directs a beam of infrared light against a spot on the object. The reflected light beam impinges on one of a series of photosensitive transducers, on different sections of a single transducer, or on a movable transducer depending on the angle between the emitted and reflected light beams, such angle being indicative of the distance from the object. The signals which are produced by one of the series of transducers or by the single or movable



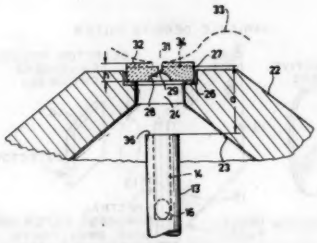
transducer are amplified and are used to change the position of the index of a measuring instrument and/or the position of the picture taking objective in a photographic apparatus.

3,714,436

RADIATION BACKSCATTERING APPARATUS USING AN APERTURED PRECIOUS STONE AS AN OBJECT SUPPORT

Helmut Fischer, Bergwaldstrasse 28, 7261 Gechingen, Germany

Filed Aug. 10, 1970, Ser. No. 62,248
Claims priority, application Germany, March 20, 1970, P 20 13 270.1
Int. Cl. H01j 1/52
U.S. Cl. 250—105 12 Claims



An apertured ring made of a metal having a lower atomic number for use in instruments for measuring the thickness of layers by means of back-scattered radio active radiation, comprises on its upper side a bearing surface for the object to be measured, a small recess in relation to the height of said ring for the unhindered passage of radiation, said recess leading into the bearing surface, and a recess in the form of a circular cone which extends from the lower side of the apertured ring and leads into the first small recess in the vicinity of its upper end. The small recess is provided in a jewel for fine mechanics which has a low atomic number and is held adhesively in a bore on the upper side of the ring.

3,714,437

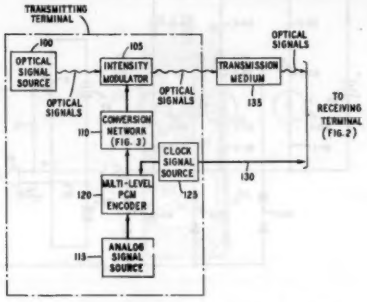
OPTICAL COMMUNICATION SYSTEM WITH PCM ENCODING WITH PLURAL DISCRETE UNEQUALLY SPACED INTENSITY LEVELS

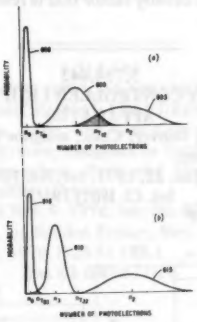
Tracy Stewart Kinsel, Bridgewater Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 14, 1970, Ser. No. 63,708
Int. Cl. H04b 9/00
U.S. Cl. 250—199 5 Claims

In an optical communication system a multilevel pulse code

modulation (PCM) format is imposed on the output of a laser. By making the spacings between intensity levels unequal, a





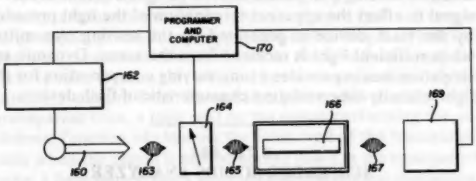
significant improvement in performance is achieved relative to a system in which the intensity levels are equally spaced apart.

3,714,438

METHOD AND APPARATUS FOR PROPAGATING TRAVELING WAVE ENERGY THROUGH RESONANT MATTER

Erwin L. Hahn, Berkeley, and Samuel L. McCall, Albany, both of Calif., assignors to The Regents of the University of California

Continuation of Ser. No. 635,193, May 1, 1967, abandoned. This application July 20, 1970, Ser. No. 64,022
Int. Cl. H04b 9/00
U.S. Cl. 250—199 **28 Claims**



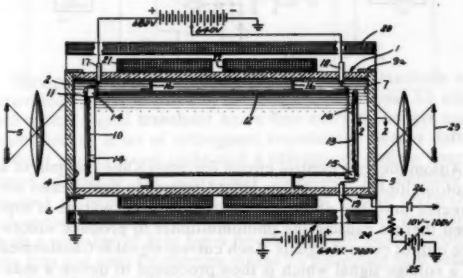
Coherent light or other coherent traveling wave energy is passed through a resonant medium containing matter normally resonant to the energy and opaque. The light pulse energy satisfies an area condition, $\pi + \Delta$, and a duration condition less than the relaxation time of the matter of which the resonant medium is composed. In passing through the matter, the pulse is reshaped and delayed. Embodiments of the invention include pulse shapers, delay lines, storage elements and logic elements. The frequency characteristics of the input pulse are also changed leading to embodiments of the invention useful as filters and frequency modulators. These properties result from the details of the resonance bands of the matter of which the medium is composed and, accordingly, lead to an extension of the invention useful in the identification of materials and the analysis and measurement of their properties and structure.

3,714,439

IMAGE COMPARISON DEVICE AND METHOD

Robert G. Williams, and Wolfgang K. Berthold, both of Fort Wayne, Ind., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 18, 1966, Ser. No. 573,287
Int. Cl. G01b 7/00
U.S. Cl. 250—201 **12 Claims**



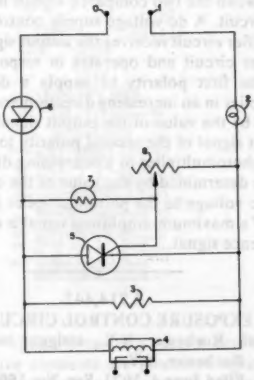
Separate simultaneously occurring radiation images are transformed by a storage electrode and a photoelectric cathode respectively into a charge image and an electron beam which are superimposed within an electron tube for comparison. An output signal is provided representing the coincidence of the two images.

3,714,440

SIMPLE, SELF-PROTECTED PHOTOELECTRIC EYE CIRCUITRY

Bruce Sargent Maccabee, 10706 Meadowhill Road, Silver Spring, Md.

Filed June 30, 1971, Ser. No. 158,456
Int. Cl. G01j
U.S. Cl. 250—206 R **1 Claim**

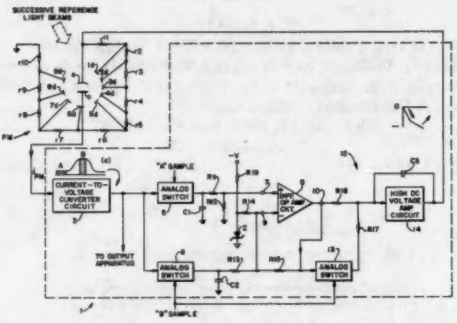


A simple photoelectric control circuit that operates when a light beam is interrupted is described. The circuit can operate electromagnetic or thermal relay switches. The circuit is arranged so that the relay will not be energized if the source of the light beam should fail.

3,714,441
PHOTOMULTIPLIER GAIN CONTROL CIRCUIT

Eugene J. Kreda, Natick, Mass., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,290
Int. Cl. H01j 39/12
U.S. Cl. 250—207 14 Claims



Automatic gain control circuit for controlling the gain of a photomultiplier. Successive pulsed reference light beams are directed onto the photomultiplier while a dc voltage is supplied thereto causing the photomultiplier to produce successive output current signals. Each current signal is transformed to a voltage signal which is then processed to derive a maximum-amplitude signal having a value related to the maximum amplitude of the signal. A differential operational amplifier circuit then compares the value of the maximum-amplitude signal with the value of a reference signal representative of a desired output current signal produced by the photomultiplier.

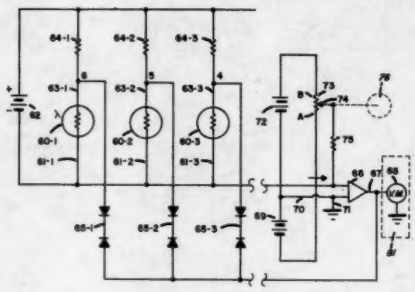
When the value of the maximum-amplitude signal is less than the value of the reference signal, indicating that the photomultiplier requires an increasing value of dc voltage for increasing the value of its gain, an output signal of a first polarity and having a value proportional to the difference between the two compared signals is produced by the amplifier circuit. When the value of the maximum-amplitude signal is greater than the value of the reference signal, indicating that the photomultiplier requires a decreasing value of dc voltage for decreasing the value of its gain, an output signal of a second polarity and having a value proportional to the difference between the two compared signals is produced by the amplifier circuit. A dc voltage supply control circuit coupled to the amplifier circuit receives the output signals produced by the amplifier circuit and operates in response to an output signal of the first polarity to supply a dc voltage to the photomultiplier in an increasing direction and varying at a rate determined by the value of the output signal, and in response to an output signal of the second polarity to supply a dc voltage to the photomultiplier in a decreasing direction and varying at a rate determined by the value of the output signal. The supply of dc voltage to the photomultiplier is controlled until the value of a maximum-amplitude signal is equal to the value of the reference signal.

3,714,442
EXPOSURE CONTROL CIRCUITRY

Lee F. Frank, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 4, 1971, Ser. No. 150,074
Int. Cl. H01j 39/12
U.S. Cl. 250—209 2 Claims

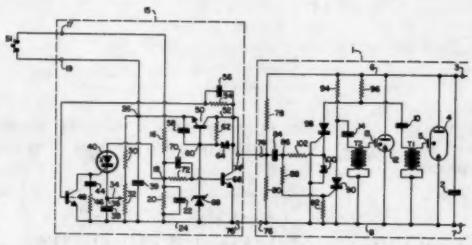
A device for measuring the density of a radiation image in which an array of photoresponsive detectors is arranged relative to the image. Each detector is responsive to the radiation derived from a respective area of the image and generates an output signal in accordance therewith. Circuit means responsive to the output signal provides an electrical measurement corresponding to a density factor that is related to at least one of the image areas.



3,714,443
REMOTELY CONTROLLED LIGHT SENSING APPARATUS

Francis T. Ogawa, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 22, 1971, Ser. No. 108,876
Int. Cl. H01j 39/12
U.S. Cl. 250—214 P 14 Claims



A light control system includes a switching means, a sensing transmitter, and a flash device, connected serially, with the sensing transmitter connected to the flash device by only two wires. The switching means is selectively operable for providing a contact closure to effect the apparent production of a light from the flash device for the illumination of a scene to be photographed. Gating means is responsive to a signal indicative of the firing of the flash device to activate the normally insensitive sensing transmitter to receive light from the scene. A signal to effect the apparent termination of the light provided by the flash device is generated by the sensing transmitter when sufficient light is received from the scene. Dynamic anticipation means provides a time varying compensation for the light intensity-time variation characteristic of flash devices.

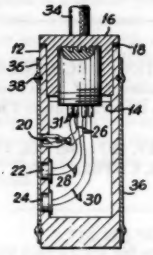
3,714,444
SUSPENDED SOLIDS ANALYZER

Larry R. Carr, Vienna, Va., and George J. Topol, Reston, Va., assignors to Keene Corporation, Aurora, Ill.

Filed July 16, 1970, Ser. No. 55,505
Int. Cl. G01n 21/36
U.S. Cl. 250—218 5 Claims

A system including an improved sensing probe for detecting and measuring the concentrations of suspended solids in a liquid. The probe includes a light source for reflecting light off suspended particles in a liquid and photocells for receiving the

reflected light and generating output signals. The output signals from both photocells are processed through a



logarithmic ratio converter to provide a single output which accurately represents the concentration of suspended solids in the liquid.

3,714,445

APPARATUS FOR OPTICAL MEASUREMENTS OF MICROBIAL CULTURES

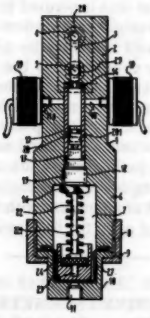
Henri T. Blachere, Paris, and Guy Georges Jamart, Saint-Denis, both of France, assignors to Institut National de la Recherche Agrenomique, Paris and Etablissements Gourdon, Maisons-Laffitte, France

Filed Nov. 9, 1970, Ser. No. 87,638

Claims priority, application France, Nov. 6, 1969, 6938124; Germany, Oct. 19, 1970, P 20 51 189.1

Int. Cl. G01n *21/26*

U.S. Cl. 250—218 **6 Claims**



A combined sampling and measuring apparatus for optical density measurements of the growth of microbial cultures in large capacity vessel, said apparatus comprising a cylindrical vertical transparent tube mounted in shunt with a closed circuit tubular system in which circulates a fraction of the microbial culture from the vessel, a piston able to slide in the transparent tube, a toric seal on the piston performing the additional function of cleaning the inner wall of the transparent tube when the piston is moved up and down in the transparent tube, a light source and a photo-cell in diametrical opposition; the piston has a diametrical port from side to side to allow the light beam from the source to get the photo-cell when the piston is between the source and the cell, and the piston is provided with means in order that the axis of the port be maintained parallel to the path of the light rays.

The whole is completed by a control block performing a succession of operations including: cleaning of the transparent tube, optical calibration, filling of the tube, and optical density measurement of the culture.

3,714,446

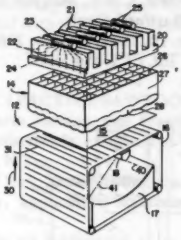
ELECTRO-OPTICAL SIGNAL TRANSLATION

Edward D. Kittredge, 43 Orange Street, Nashua, N.H.

Filed March 19, 1970, Ser. No. 20,921

Int. Cl. G01n *21/30*

U.S. Cl. 250—219 D **28 Claims**



Electro-optical signal translation means and methods are provided for use in printing and other applications. An electro-optical signal translator has a font carrying images each identified by a set of orthogonal coordinates. Means define radiant energy beam paths and a plurality of radiant energy sensitive means are operatively positioned for defining a second orthogonal coordinate. The first means preferably comprises a plurality of light sources operatively associated with a plurality of light pipes for passing light beams through the font and onto a deflecting means for deflecting light beams to photoelectric cells for defining the second orthogonal coordinate and thus selecting a particular image carried by the font.

3,714,447

APPARATUS FOR THE PHOTO-OPTICAL READING OF MARKS AND PERFORATIONS ON RECORD MEDIA

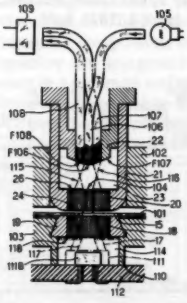
Francois Denis Jallais, Belfort, France, assignor to Societe Industrielle Bull-General Electric (Societe Anonyme), Paris, France

Filed June 25, 1970, Ser. No. 49,736

Claims priority, application France, June 25, 1969, 6921330

Int. Cl. H01j *5/16*

U.S. Cl. 250—227 **13 Claims**



Apparatus for optically reading record bearing media in which the sensitive elements are protected against dust and vapors, wherein the light transmitting end of the light source which illuminates the media and the light receiving end of the light collector which receives light from the media are enclosed in an airtight housing, and wherein light communication between the interior of the housing and the media is provided by a light conducting block in the wall of said housing.

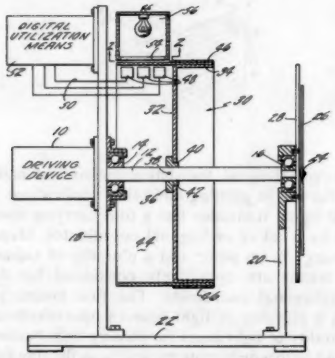
ERRATUM

For Class 250—235 see:
Patent No. 3,714,524

3,714,448
LIGHT WEIGHT, LOW TORQUE, INEXPENSIVE DRUM TYPE OPTICAL DIGITAL SHAFT ANGLE ENCODER

John J. Cronan, Fairfield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 10, 1971, Ser. No. 206,670
Int. Cl. G01d 5/36
U.S. Cl. 250—231 SE 1 Claim

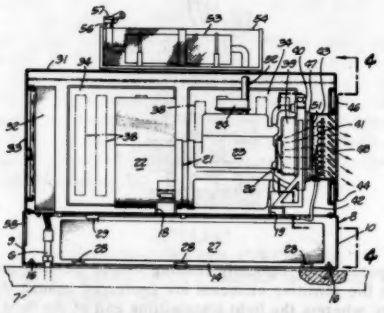


A low cost, light weight drum type optical encoder for producing a digital manifestation of the position of a shaft, such as the indicator needle shaft of a gauge or a weighing scale, comprises a small light weight dish with a strip of material, such as plastic or metal having coded optical transmissivity or reflectivity thereon, held to the flanged rim of the dish by a shrunken ring retainer. Light passing through a slit is transmitted by or reflected from the code drum in a coded fashion to be sensed by appropriately disposed photodetectors, the signals from which are used in any digital fashion.

3,714,449
PORTABLE ENGINE-GENERATOR POWER UNIT WITH COOLING

Gasper V. De Bella, Hillsborough, Calif., assignor to Cal-West Electric Inc., San Francisco, Calif.

Filed May 5, 1971, Ser. No. 140,516
Int. Cl. H02k 9/18
U.S. Cl. 290—1 1 Claim

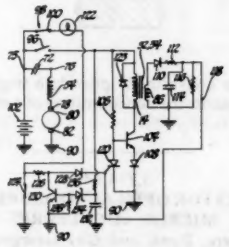


A portable engine-generator power unit has a rectangular base frame enclosing a fuel tank for the engine. An engine-generator set is mounted on beams spanning the base frame over the tank. A housing rests on the base frame and encloses the engine-generator set. The engine fan blows air received through ingress louvers in the housing through the engine radiator and then through a shroud having egress louvers in the housing. A loading coil connected to the generator is supported within the shroud which is hinged to be swung toward and away from the radiator.

3,714,450
STARTING MECHANISM

Elbert M. Sawyer, Torrance, Calif., and Fred H. Kelly, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed April 19, 1971, Ser. No. 134,962
Int. Cl. F02n 11/00
U.S. Cl. 290—37 8 Claims

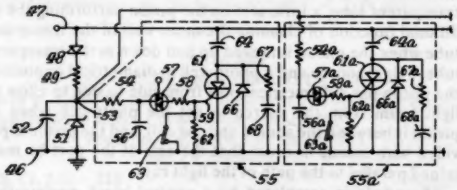


The output shaft of a starting mechanism is translatable by the magnetic flux of an energized actuator coil located about the shaft. The return path for this magnetic flux includes a cylinder affixed to the housing of the mechanism, an armature rotatable relative to both the shaft and housing, and a tachometer wheel driven by the shaft. The cylinder has one set of flanges that coact with a magnetic flux to pivot the armature and another set to coact with the tachometer wheel to induce a voltage in a tachometer coil as a result in changes in magnetic field through the cylinder. A pinion on the output shaft drives an idler gear that is pivoted into engagement with the starter gear of an internal combustion engine by a bracket connected to the actuator armature by a leaf spring. The actuator armature is also connected to the field switch for the starting motor by a linkage that closes the switch to start the motor when the magnetic flux aligns the armature with the flanges of the cylinder. Above a predetermined speed, a frequency detection circuit connected with the tachometer coil opens the current path through the actuator coil. When the actuator coil subsequently deenergizes, a return spring pivots the armature out of alignment with the flanges to disengage the starter gear and open the field switch.

3,714,451
PHASE SELECTIVE TELEMETRY SYSTEM

John A. Whitney, Fort Wayne; Richard E. Woods, Markle, and William H. Hohman, Bluffton, all of Ind., assignors to Franklin Electric Co., Inc., Bluffton, Ind.

Filed July 12, 1971, Ser. No. 161,530
Int. Cl. H04g 9/14
U.S. Cl. 307—3 14 Claims



This disclosure deals with a telemetry system adapted to be connected across a pair of transmission lines, the system

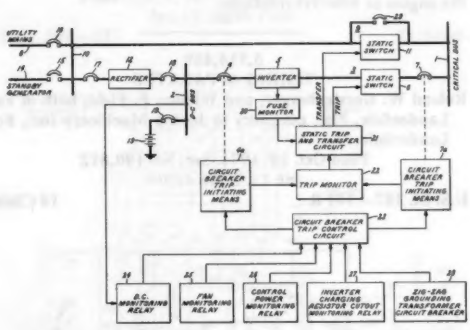
generating pulses at one location along the line and detecting such pulses at another location. The system is designed for use with a transmission line carrying alternating current and includes one or more pulse transmitters or generators, each of which generates a pulse at a precise phase angle in each cycle of alternating current. The system also includes a pulse receiver or detector associated with each transmitter, each receiver responding only to pulses at the phase angle of the associated transmitter. The phase angle at which a transmitter generates and the associated receiver responds to a pulse is determined by a timing circuit which actuates a device in each AC cycle. In the transmitter, the device is part of a pulse generating circuit and in the receiver the device is part of a pulse responsive circuit.

3,714,452

CIRCUIT BREAKER MONITOR FOR UNINTERRUPTABLE POWER SYSTEMS INCLUDING A STATIC BYPASS

Dennis F. Williamson, Media, Pa., assignor to General Electric Company, New York, N.Y.

Filed Feb. 7, 1972, Ser. No. 224,195
Int. Cl. H02j 3/00
U.S. Cl. 307—86 5 Claims



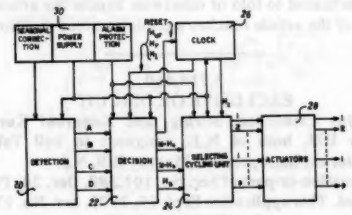
An uninterruptable power system including main apparatus for supplying power to a critical bus, the main apparatus includes electromechanical circuit breakers and a static switch. Bypass apparatus is also provided including a static switch to supply power to the critical bus in high-speed response to the actuation of the circuit breaker trip initiating means.

3,714,453

LOAD REGULATING SYSTEM

Jules Delisle; Pierre A. Deschenes, and Adrien Leroux, all of Sherbrooke, Quebec, Canada, assignors to Consulab Inc., Beauport, Quebec, Canada

Filed May 6, 1971, Ser. No. 140,671
Int. Cl. H02j 13/00
U.S. Cl. 307—39 8 Claims



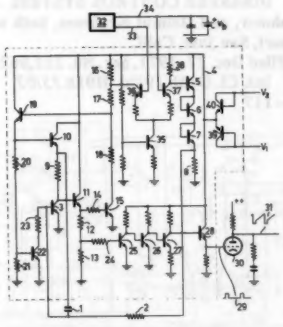
The disclosure herein describes an improved load regulating system for selectively adding or dropping load circuits in a local electrical distribution system based on the power measured by the utility company and using a demand meter similar to the one installed by the utility company but modified to detect information concerning the power consumed by the plant within preselected limits; the system further includes a decision circuit which is fed with the information received from the detecting apparatus and which feeds this information combined with synchronization pulses received from a clock mechanism to a selecting-cycling unit which, in turn, triggers actuators associated with the load circuits.

3,714,454

STABILIZED CAPACTIVE SAWTOOTH GENERATOR

Paulus Joseph Maria Hovens, and Wouter Smeulers, both of Emmasingel, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,677
Claims priority, application Netherlands, Dec. 6, 1969, 6918361
Int. Cl. H03k 1/04, 1/16, 4/56
U.S. Cl. 307—109 9 Claims



A semiconductor arrangement for charging and discharging a capacitor. The discharge period is stabilized for variations in temperature and supply voltage by making the charge voltage equal to the discharge voltage applied across the leakage resistor. This is implemented by connecting the leakage resistor to the supply voltage through a plurality of stabilizing transistors, while the capacitor is charged from the supply voltage through switching transistors. The charge period is made much shorter than the discharge period and in one preferred embodiment all components except the leakage resistor and the capacitor are integrated in a semiconductor body. Two transistors in a common emitter configuration driving a third transistor are described to provide the capability for controlling the frequency and phase of the output signal of said arrangement.

3,714,455

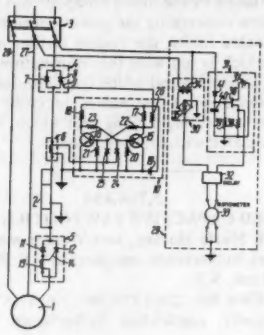
INSULATION TESTER

Viktor Gavrilovich Chepelev; Nikolai Nikolaevich Grinchenko, and Jury Moiseevich Goldshein, all of Kharkov, U.S.S.R., assignors to Spetsialnoe Proektno-Konstruktorskoe I Tekhnilogicheskoe Bjuro PO Elektrobureniju (Sktbe), Kharkov, U.S.S.R.

Filed July 21, 1971, Ser. No. 164,580
Int. Cl. H02b 1/24
U.S. Cl. 307—112 1 Claim

An insulation tester comprising a down-the-hole switching element and an out-of-the-hole switching element using a

parallel-opposing combination of a rectifier and a thyristor, a control unit, a current transformer, and a measuring unit com-

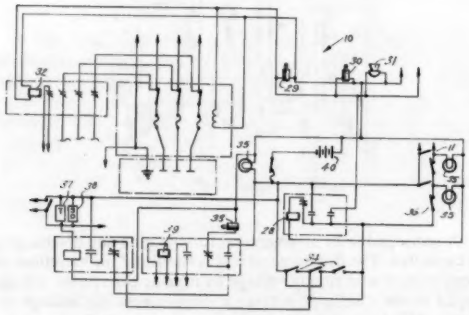


prising a voltage-amplitude meter, a rectifier, a differential relay, and a ratiometer.

3,714,456
DISASTER CONTROL SYSTEM

Gerhard Krohmer, and Helmut Krohmer, both of 4156 Casa Grande Court, San Jose, Calif.

Filed Dec. 27, 1971, Ser. No. 212,062
Int. Cl. G08b *19/00*; H01h *35/02*
U.S. Cl. 307—117 **4 Claims**

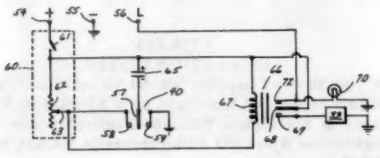


A safety system. This system consists primarily of relay means together with a mercury switch, solenoids, and other component means for controlling utilities during the event of an earthquake.

3,714,457
TIME DELAY SWITCHING SYSTEM WITH IMPROVED TWENTY-FOUR HOUR CONTROLLER

John W. Sweeney, Route 2, Boerne, Tex.

Filed June 22, 1971, Ser. No. 155,530
Int. Cl. H01h *43/20*
U.S. Cl. 307—141 **6 Claims**

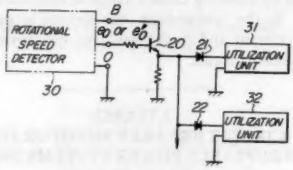


A direct current operated timer including means to apply said direct current to a device at a remote location to activate the same in accordance with a preset schedule and for a predetermined period of time.

3,714,458
METHOD FOR SUPPLYING ROTATIONAL SPEED SIGNALS

Hiroshi Arai, and Takakazu Mori, both of Toyoto, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyotashi, Japan

Filed March 24, 1971, Ser. No. 127,650
Claims priority, application Japan, April 2, 1970, 45/29127
Int. Cl. H01h *35/00*
U.S. Cl. 307—120 **4 Claims**

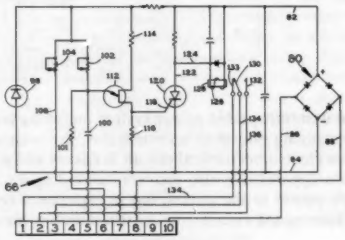


A method by which even if a plurality of devices requiring information in terms of the rotational speed of an engine or a wheel are installed in the same automobile, only one rotational speed detector for each phenomenon is employed to operate a plurality of devices requiring information in terms of the engine or wheel revolutions.

3,714,459
TIMING APPARATUS

Roland W. Gerstenberger, and William E. Field, both of Fort Lauderdale, Fla., assignors to Jensen Machinery Inc., Fort Lauderdale, Fla.

Filed Oct. 20, 1971, Ser. No. 190,812
Int. Cl. H01h *43/04*
U.S. Cl. 307—141 R **14 Claims**



A variable charge rate timer including a capacitance, a power source, first and second resistances connected in parallel between the power source and the capacitance, and controls which make and break the circuit path through at least one of the resistances for selecting and controlling the charging rate of the capacitance. In a laundry apparatus, the capacitance charges through one resistance at a relatively slow rate while a laundry article traverses a sensing means, and then the capacitance charges at a faster rate until output means is actuated to fold or otherwise handle the article when a portion of the article reaches a predetermined position.

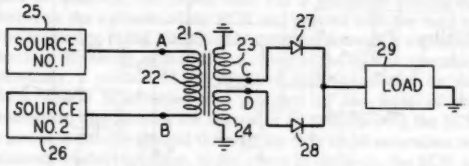
3,714,460
EXCLUSIVE OR CIRCUIT

Warren Jay Clemetson, Stiring, and Kaneyuki Kurokawa, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 101,380, Dec. 24, 1970, abandoned. This application Sept. 10, 1971, Ser. No. 179,418
Int. Cl. H03k *19/32*
U.S. Cl. 307—216 **10 Claims**

An exclusive OR circuit comprises a primary winding having two input terminals and being closely coupled to first and

second secondary windings. Rectifying diodes are connected to adjacent ends of the first and second secondary windings, which are adjacent the center of the primary winding. This configuration transmits an output pulse through one of the



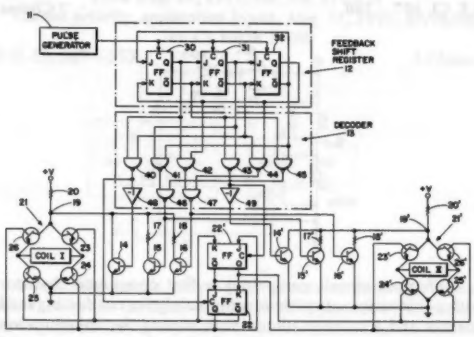
diodes only upon the application of one input pulse to one of the input terminals, and gives high speed voltage cancellation if coincident pulses are applied. In another embodiment, transistors used in place of the diodes give signal gain.

3,714,461

GENERATION OF MULTILEVEL DIGITAL WAVEFORMS

Arthur Edward Dodson, Ottawa, Ontario, Canada, assignor to Bell Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed Nov. 5, 1971, Ser. No. 196,019
Int. Cl. H03k *3/00*
U.S. Cl. 307—227 **2 Claims**



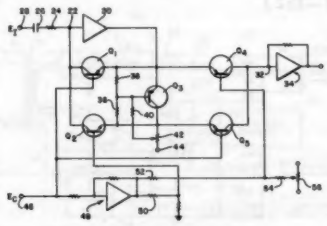
A circuit is disclosed for the generation of multi-level digital waveforms. The basic circuit, with some additions, is also capable of generating two or more of such waveforms, which have determinable phase relationships.

3,714,462

MULTIPLIER CIRCUITS

David E. Blackmer, Bolton Road, Harvard, Mass.

Filed June 14, 1971, Ser. No. 152,664
Int. Cl. G06g *7/12*
U.S. Cl. 307—229 **14 Claims**



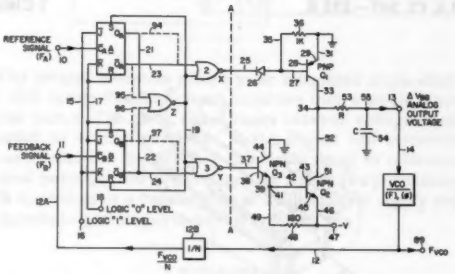
A gain control or multiplier circuit in which an input operational amplifier has a pair of feedback paths through respective collector-emitter circuits of opposite conductivity type transistors to form a first bipolar circuit for converting an input signal to a log form by virtue of the log-linear transfer characteristics of the transistors. Each transistor of the first circuit has connected to it another transistor for converting the log signal into its antilog. A second operational amplifier is used as an output buffer for the resulting combined output signals from the antilog transistors. One version employs a bias circuit connected between the emitters of the first bipolar circuit transistors to adjust quiescent current. Another version uses a neutralization circuit to pump currents into the input summing junctions of both operational amplifiers to adjust for capacitive storage effects. In all cases, a control voltage is summed with the log signal by applying the voltage to the bases of the log and antilog converting transistors, thereby controlling the gain between the two operational amplifiers.

3,714,463

DIGITAL FREQUENCY AND/OR PHASE DETECTOR CHARGE PUMP

Jon M. Laune, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 4, 1971, Ser. No. 103,389
Int. Cl. H03b *3/04;* **H03d** *13/00*
U.S. Cl. 307—232 **11 Claims**



A digital frequency and/or phase detector is disclosed wherein a time varying reference signal is received in one bistable device only, a time varying feedback signal is received in another bistable device only, and corresponding portions of each cycle of said signals are compared in digital logic circuitry supplied by the outputs of the two bistable devices. A logic signal developed by the first occurrence of the corresponding portion of one of the time varying signals effects, through the logic circuitry, turn on of a responsive circuit, a logic signal developed by the subsequent occurrence of the corresponding portion of the other of said time varying signals effects, through the logic circuitry, turn off of such responsive circuit, and an analog signal is developed by such responsive circuit in relation to the time interval between the occurence of the corresponding portions of the time varying signals.

3,714,464

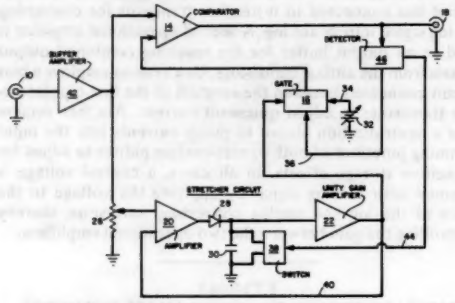
DETECTING CIRCUIT FOR INDICATING OCCURRENCE OF PEAK IN AN INPUT SIGNAL

Ronald Nutt, Knoxville, Tenn., assignor to Ortec, Incorporated, Oak Ridge, Tenn.

Filed July 9, 1970, Ser. No. 53,359
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **7 Claims**

A circuit for processing an input signal incorporating a technique of constant fraction timing on the trailing edge of

the input signal. The processing is performed in such a manner that the resultant timing signal is independent of the pulse shape and further incorporates means for adjusting the level at



which the timing signal is derived in order to optimized the statistical or rms noise uncertainty and further serves to minimize the time delay from the peak of the input signal.

3,714,465

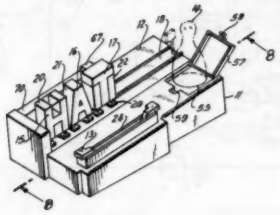
ANALOG DECISION CIRCUIT

David Hans Skrenes, Route 1, Byron, Minn.

Filed Jan. 14, 1972, Ser. No. 217,770

Int. Cl. H03k *5/20, 19/30;* **G06g** *7/14*

U.S. Cl. 307—235 R **7 Claims**



An analog decision circuit for analyzing a group of analog signals and identifying and ordering these signals according to their magnitudes. A first analog signal OR circuit identifies the largest magnitude analog signal and by means of a feedback circuit, this signal is eliminated from a second analog signal OR circuit which identifies the next largest analog signal. A second feedback circuit eliminates the second largest analog signal from the input of a third analog signal OR circuit which identifies the third largest analog signal. Similar circuitry is provided for each additional analog signal. Comparator circuits are also included to determine the separation between one largest analog signal and the next largest signal.

3,714,466

CLAMP CIRCUIT FOR BOOTSTRAP FIELD EFFECT TRANSISTOR

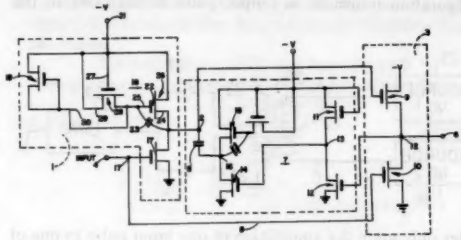
John R. Spence, Villa Park, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Dec. 22, 1971, Ser. No. 210,660

Int. Cl. H03k *5/08*

U.S. Cl. 307—237 **6 Claims**

A clamp field effect transistor is connected between the gate electrode of a bootstrap driver circuit and a voltage level. The clamp becomes responsive to voltage levels fed-back to the gate electrode of said driver circuit for clamping the voltage on the gate electrode to a level which holds the driver circuit off when the output voltage level from the driver circuit becomes approximately equal to the first voltage level. As a result, the voltage level at the output of the driver circuit can



be increased in magnitude for providing a relatively higher voltage for driving other circuits.

3,714,467

CHOPPER CIRCUIT

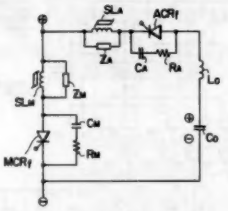
Shizuo Kariya; Hiroshi Narita; Takashi Tuboi, all of Katsuta, and Tetsuya Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed March 29, 1971, Ser. No. 128,722

Claims priority, application Japan, March 27, 1970, 45/25280

Int. Cl. H03k *17/56*

U.S. Cl. 307—240 **7 Claims**



A chopper circuit comprising a first compound thyristor with a first series saturable reactor mainly for conducting load current and a commutation circuit storing the commutation energy for commutating the first thyristor by igniting a second thyristor, the construction of the junction in these two thyristors consisting of a thyristor included in this circuit with a second series saturable reactor region and a diode region in reverse parallel connection and one common junction and saturable reactors connected to said thyristors in series.

3,714,468

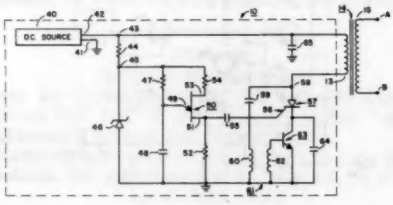
PULSED POWER SUPPLY SYSTEM

Eric C. Hopkinson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 28, 1971, Ser. No. 166,791

Int. Cl. H03k *17/56*

U.S. Cl. 307—252 J **9 Claims**



A DC source is coupled into a unijunction transistor relaxation oscillator with the output of the oscillator driving the gate

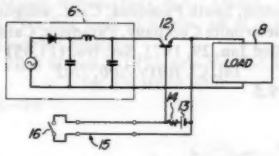
of an SCR. The voltage pulse appearing on the anode of the SCR is transformer coupled into a voltage multiplier circuit, the output of which is connected between the ion source anode and cathode of an accelerator tube used for producing fast neutrons from the D-T reaction. Because SCR's are subject to latch-up, the circuit also has a transistor connected between the cathode of the SCR and ground with the base of the transistor being transformer coupled through a capacitor back to the anode of the SCR. As long as the SCR is operating normally, a portion of the negative pulse developed on the SCR anode is inverted and coupled to the base of the transistor, thus turning the transistor on and allowing the SCR current to flow to ground through the very small saturation resistance of the transistor. In the event of latch-up, the SCR no longer produces pulses, thereby removing the drive from the transistor leaving the transistor in a non-conducting state. Thus, a high impedance is presented between the cathode of the SCR and ground. The SCR will then recover to its non-conducting state. There is sufficient impedance on the SCR cathode, however, that it will try to turn on again from the gate drive supplied by the unijunction relaxation oscillator and thus a pulse will be produced to drive the transistor into conduction and the circuit will begin to operate in a normal mode.

3,714,469

SWITCHING CIRCUIT

Kosaku Uchida, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 27, 1971, Ser. No. 175,631
Claims priority, application Japan, Aug. 31, 1970, 45/76546
Int. Cl. H03k *17/60*
U.S. Cl. 307—253 **3 Claims**



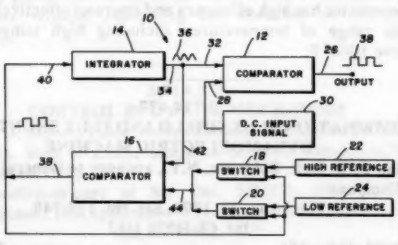
A switching circuit adapted for remote-control of a television receiver or the like, wherein there is provided a transistor having the collector and emitter thereof connected between a DC power source and a load, said transistor normally functioning as a voltage regulator, and by remote-control of the base current of said transistor, electric power being supplied to said load is turned on or off.

3,714,470

VARIABLE DUTY CYCLE SIGNAL GENERATOR

Jack Goldberg, Marshalltown, Iowa, assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 23, 1971, Ser. No. 211,246
Int. Cl. H03k *5/00*; **G06g** *7/12*
U.S. Cl. 307—261 **4 Claims**



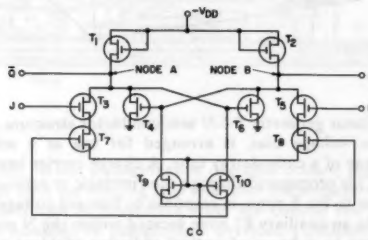
Described herein is a variable duty-cycle signal generator including an integrator circuit for generating a predetermined time-base reference signal which is generally triangular in shape. This time-base signal is compared with a D.C. input signal by a first comparator circuit, whose output is a signal comprised of a series of pulses and having a duty cycle corresponding to the level of the D.C. input signal. A second comparator circuit is employed to monitor the time-base signal and drive the integrator circuit such that the peaks or turn around points of the triangular signal are fixed to levels determined by reference potentials selectively applied to the input of the second comparator.

3,714,471

SINGLE-CHANNEL MIS FLIP-FLOP CIRCUIT

Kenneth K. Au, Ottawa, Ontario, Canada, assignor to Microsystems International Limited, Montreal, Quebec, Canada

Filed Nov. 24, 1971, Ser. No. 201,659
Int. Cl. H03k *3/286*
U.S. Cl. 307—279 **5 Claims**



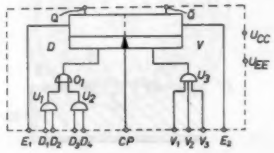
The present invention relates to an integrated single-channel MIS binary flip-flop circuit requiring only a single clock signal source. The clock signal varies between voltage levels adapted to enable transistors in the circuit and reference ground potential. By swinging the clock signal to reference ground potential, the requirement for either complementary MIS transistors or a combination of a clock signal supply and an inverted signal supply thereof is avoided.

3,714,472

MULTIPLE-INPUT BISTABLE MULTIVIBRATOR

Klaus Lagemann, Achternvelde, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 768,365, Oct. 17, 1968, abandoned. This application July 28, 1971, Ser. No. 166,983
Claims priority, application Germany, Oct. 21, 1967, P 15 37 298.2
Int. Cl. H03k *3/286*
U.S. Cl. 307—291 **6 Claims**

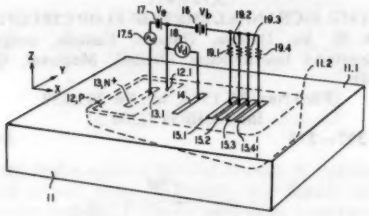


A bistable multivibrator having two complementary outputs, two unidentical inputs V and D and one clock-pulse input. The logical connection between inputs and outputs is arranged so that at the application of a signal "1" to the input V one output indicates subsequent to the reception of a clock pulse at the clock-pulse input, always that signal "0" or "1" that has been applied to the input D prior to the reception of the clock pulse. At the application of the signal "0" to the input V the output does not change state at the reception of a clock pulse independently of the signal at the input D.

3,714,473
PLANAR SEMICONDUCTOR DEVICE UTILIZING CONFINED CHARGE CARRIER BEAMS

Dirk Jan Bartelink, Morris Township, and George Persky, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 12, 1971, Ser. No. 142,629
Int. Cl. H01l 5/00
U.S. Cl. 307—299 **17 Claims**

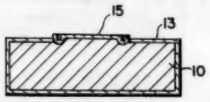


A planar geometry P-I-N semiconductor structure, under a reverse voltage bias, is arranged for use as a solid state analogue of a cathode-ray tube. A charge carrier beam (of "holes") is propagated through the (intrinsic or semi-intrinsic) I region to the P zone, in response to forward voltage bias applied to an auxiliary P^+ zone located within the N zone, or in response to a beam of optical radiation incident on the N zone. While traversing the I region, this charge carrier beam maintains a relatively confined cross section while it is controllably deflected in two independent directions by auxiliary applied electric fields. Thereby, the position of impact of the charge-carrier beam at the P zone is controllable in two dimensions, and the instantaneous impact position can be detected thereat by a two-dimensional array of detector load resistors connected to the P zone.

3,714,474
ELECTRON-VOLTAIC EFFECT DEVICE

Frederick B. Hoff, Jr., Bedford, Tex., assignor to ECC Corporation, Euless, Tex.

Filed Oct. 7, 1970, Ser. No. 78,757
Int. Cl. G21d 7/00
U.S. Cl. 310—3 B **8 Claims**

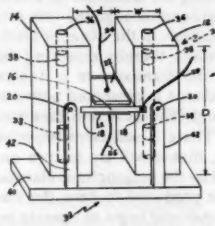


Disclosed is an electron-voltaic semiconductor power source comprising a semiconductor body with a PN junction terminating in a passivated channel on one surface of the device. A radioactive source with V less than the radiation damage threshold of the semiconductor is used to generate carriers within the semiconductor body and the entire device is shielded with a metal casing formed on the device surface which also serves as electrical contacts for the device.

3,714,475
RESONATOR HAVING COUNTER ROTATING RIGID PARTS

Hugh M. Baker, Jr., Washington, D.C., assignor to H. B. Engineering Corporation, Silver Spring, Md.

Continuation of Ser. No. 565,430, July 15, 1966. This application Sept. 11, 1970, Ser. No. 71,394. The portion of the term of this patent subsequent to July 1, 1986, has been disclaimed.
Int. Cl. H01v 7/00
U.S. Cl. 310—8.2 **15 Claims**

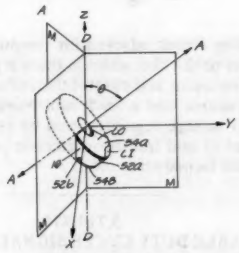


There is disclosed a resonator having rigid oscillating parts interconnected by a resilient web for inducing counterrotary movement of the rigid parts. The rigid parts are mounted to rotate about the nodal axis thereof. The nodal axis of each rigid part intersects the center of gravity of the part.

3,714,476
COMPRESSION ACCELOROMETER UTILIZING A LITHIUM NIOBATE PIEZOELECTRIC CRYSTAL

Howard C. Epstein, South Pasadena, Calif., assignor to Becton, Dickinson Electronics Company, Pasadena, Calif.

Filed Jan. 29, 1971, Ser. No. 111,051
Int. Cl. H01v 7/00, 7/02
U.S. Cl. 310—9.5 **8 Claims**



The transducer of this invention utilizes an annular lithium niobate crystal operated in the compression mode with the sensitive axis of the crystal arranged at an angle of about −51.4° to the Z, or optical, axis of the crystal in the first and third quadrants of the Y-Z plane of the crystal. This accelerometer has high efficiency and operates effectively over a wide range of temperatures, including high temperatures above 1000° F.

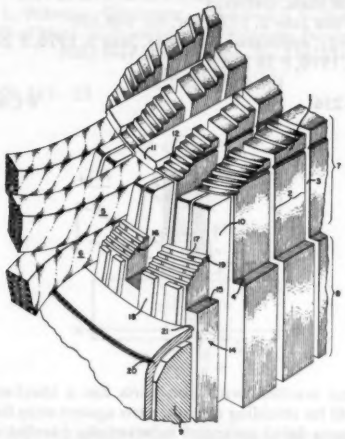
3,714,477
COMBINATION FLUX SHIELD AND FLUX SHUNT FOR A DYNAMOELECTRIC MACHINE

Brian E. B. Gott, Delanson, N.Y., assignor to General Electric Company

Filed Aug. 23, 1971, Ser. No. 173,749
Int. Cl. H02k 1/12
U.S. Cl. 310—256 **2 Claims**

A combination flux shield and flux shunt for the end of a laminated dynamoelectric machine stator core to redirect and

to control the stray end region flux so as to minimize the effects of axial flux penetration into the stator core. A low permeability, electrically conductive flux shield deflects flux



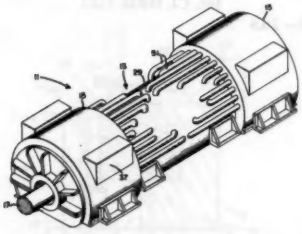
from the generator core "yoke" portion into the "tooth" portion and a high permeability flux shunt with stepped laminations in the tooth portion collects flux and diverts it into a radial path parallel to the main synchronous flux.

3,714,478

GAS COOLED DYNAMOELECTRIC MACHINE

Dominic DeMania, Schenectady, N.Y.; Allan C. Shartrand, and Sterling C. Barton, both of Scotia, all of N.Y., assignors to General Electric Company

Filed March 2, 1972, Ser. No. 231,157
Int. Cl. H02k 9/00
U.S. Cl. 310—55 **6 Claims**



In a large, gas cooled, dynamoelectric machine, the gas coolant is transported to and from the end frames and the machine electromagnetic core by a number of axially disposed pipes which are mounted externally outside of a gas-tight outer wrapper which surrounds the core. All axial gas flow between the core and the end frames is directed through the external pipes. This invention permits a larger diameter rotor and core without increasing the diameter of the outer wrapper.

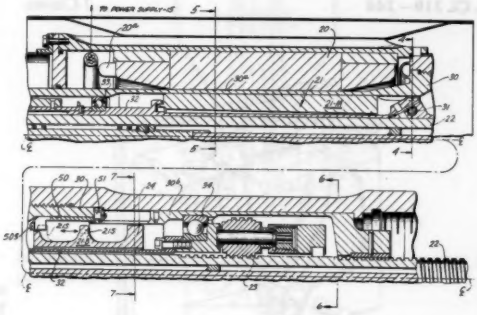
3,714,479

CONTROL ROD DRIVE MECHANISM

Wesley D. Moore, Palos Verdes Estates, and Silveus M. Baker, Tustin, both of Calif., assignors to Royal Industries, Inc., Pasadena, Calif.

Continuation-in-part of Ser. No. 840,451, July 9, 1969, abandoned. This application Nov. 13, 1970, Ser. No. 89,174
Int. Cl. H02k 7/12
U.S. Cl. 310—80 **10 Claims**

A control rod drive mechanism for a nuclear reactor including means for preventing the excessive compressive loading of the control rod by the control rod drive motor. The drive motor is constructed with a "floating" rotor assembly for allowing it to translate upwardly in response to a compressive overload. The rotor is defined as comprising two pivoted segments with one of the rotor segments adapted for engaging a stop provided for the pressure housing of the control rod drive



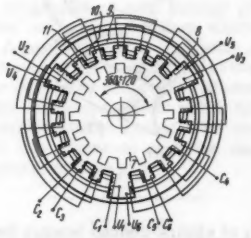
mechanism. When a compressive overload occurs, the rotor translates until the housing stop and rotor interengage so that the rotor torque is transferred from the control rod to the pressure housing. A compressive overload condition exists whenever the friction loading exceeds the combined weight of the control rod and associated components.

3,714,480

HETEROPOLAR INDUCTOR GENERATOR

Voldemar Voldemarovich Apsit; Juris Leovich Kokle; Karl Ernestovich Skrutzitis, and Mikhail Ivanovich Schukin, all of Riga, U.S.S.R., assignors to Fiziko-Energetichesky Institut Akademii Nank Latviiskoi SSR, Riga, U.S.S.R.

Filed Dec. 23, 1971, Ser. No. 211,574
Int. Cl. H02k 19/24
U.S. Cl. 310—170 **1 Claim**

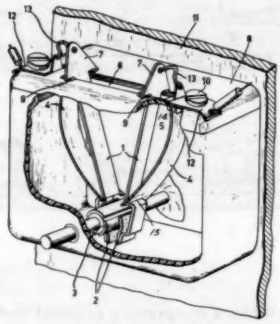


The induction machine of this invention comprises a stator with the slots thereof carrying a polyphase exciting winding and an armature winding; each phase of said armature winding consisting of at least two series-connected branches made up by separate coils; in each phase of the armature winding the coils of one branch are displaced relative to the similar coils of the other branch of an electric angle equal to the electric angle between the adjacent phases of the exciting windings encircling said branches.

3,714,481
BRUSH CONSTRUCTION FOR A SMALL ELECTRODYNAMIC MACHINE

Homme Dijkstra, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 864,380, Oct. 7, 1969, abandoned. This application May 11, 1971, Ser. No. 142,398
Claims priority, application Netherlands, Oct. 9, 1968, 6814414
Int. Cl. H02k *13/00*
U.S. Cl. 310—244 7 Claims

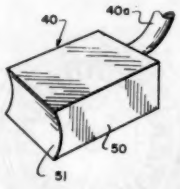


A brush-holder assembly for an electrodynamic machine such as an electric motor, with the brush-holder arm urged by a separate leaf spring both axially and laterally.

3,714,482
BRUSH WEAR INHIBITOR FOR DYNAMOELECTRIC MACHINES

Melvin A. Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation-in-part of Ser. No. 86,792, Nov. 4, 1970, abandoned. This application Oct. 27, 1971, Ser. No. 192,905
Int. Cl. H01r *39/56*
U.S. Cl. 310—228 9 Claims

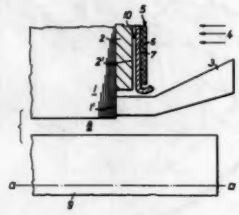


The longevity of electric contact brushes for dynamoelectric machines is extended by impregnating them with a material of octadecylamine with a hydrohalogen radical which is formed into a saturated solution in a hydrocarbon solvent. The saturated solution is applied to the brush either by direct application or by vacuum impregnation. The compound of octadecylamine with a hydrohalogen radical may also be introduced to the interface of the contact brush and commutator by means of a feeder brush. The carbon contact brush or feeder brush may be dipped in acid and washed in water prior to impregnation with the compound. Additionally, the compound may be mixed in a lacquer solution and painted on the leading edge of the contact brush or feeder brush.

3,714,483
SHIELD FOR ELECTRICAL MACHINES

Werner Nuraberg, and Rolf Hanitsch, both of Berlin, Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed June 2, 1971, Ser. No. 149,139
Claims priority, application Germany, June 3, 1970, P 20 28 288.6; June 3, 1970, P 70 21 582.6
Int. Cl. H02k *1/12*
U.S. Cl. 310—256 6 Claims

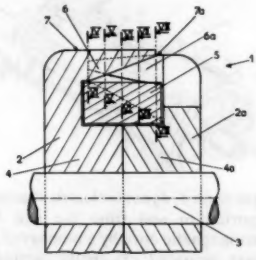


An electrical machine with iron parts has a sheet-metal magnetic shield for shielding the iron parts against stray fields. The shield has a layer arranged substantially parallel with respect to a surface of the iron parts. This layer has a first partial layer of sheets disposed adjacent the surface and constructed from a nonmagnetic material having high electrical conductivity, and a second partial layer of sheets constructed from a material having a high relative permeability.

3,714,484
ROTOR ASSEMBLY FOR USE IN A DYNAMO ELECTRIC MACHINE

Roger Jean Hubert, Epinay, Seine, France, assignor to Ducellier & Cie, Paris, France

Filed March 15, 1971, Ser. No. 124,147
Claims priority, application France, March 16, 1970, 7009272
Int. Cl. H02k *1/22*
U.S. Cl. 310—263 1 Claim



This invention relates to a rotor assembly for use in a dynamo electric machine, the rotor assembly having two parts which are mounted on a rotor shaft, each of the paths having a periphery a plurality of pole pieces of generally trapezoidal shape which extend in a direction substantially parallel to the axis of the rotor shaft. The pole pieces of the two paths are interdigitated and arranged such that in use the pole pieces associated with the two parts have opposite polarities, the non parallel sides of each pole piece being spaced from the adjacent sides of adjacent pole pieces and a portion of the outer face of each pole piece being of part cylindrical configuration. The outer edges of the sides of each pole piece when seen in developed plan view are inclined relative to the rotor axis by different amounts and a relieved portion is provided in the outer face adjacent to one of these edges so that the part cylindrical portion of the outer face has substantially the shape of an isoscelese trapezium.

3,714,485

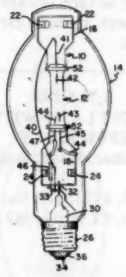
HARNESS FOR SUPPORTING HIGH PRESSURE ELECTRIC DISCHARGE TUBE WITHIN OUTER ENVELOPE AND LAMP FORMED THEREBY

Carl L. Peterson, Gloucester, and Edward A. Webb, Reading, both of Mass., assignors to GTE Sylvania, Incorporated

Filed May 24, 1971, Ser. No. 146,174

Int. Cl. H01j 61/52

U.S. Cl. 313—25 3 Claims



A support harness for an arc tube of high-pressure electric discharge lamp is described herein. The arc tube of the lamp is provided with preformed notches in its press seal portion. A pair of formed support straps coincidental in shape to the preformed notches are placed over the notches and are welded at their outer ends to securely hold the arc tube in axial alignment within the envelope of the lamp.

3,714,486

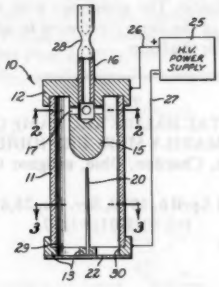
FIELD EMISSION X-RAY TUBE

James H. McCrary, 3032 Phoenix Street, Las Vegas, Clark County, Nev.

Filed Oct. 7, 1970, Ser. No. 78,778

Int. Cl. H01j 35/00

U.S. Cl. 313—55 6 Claims



A miniature X-ray tube with D.C. power supply and a cold cathode field emission electron beam for continuous or steady state X-ray output. A tube a few centimeters in length with a needle cathode along the axis of the tube and with an exit window at the end behind the cathode for optimum X-ray output.

3,714,487

X-RAY TUBE HAVING EXTERNAL MEANS TO ALIGN ELECTRODES

Heinz-Jurgen Jacob, Norderstedt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

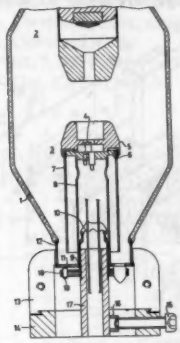
Filed Feb. 22, 1971, Ser. No. 117,436

Claims priority, application Germany, March 26, 1970, P 20 14 937.5

Int. Cl. H01j 35/04

U.S. Cl. 313—60 1 Claim

An X-ray tube having at least one electrode connected with the tube envelope so as to provide for alignment of the electrodes. This is implemented by supporting the electrode upon



an intermediate member which can be deformed to vary the position of the electrode.

3,714,488

PICK-UP TUBE ENVELOPE SEALANT EXTENDING INTO GROOVE OF ANNULAR TARGET SUPPORT

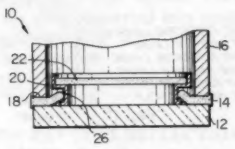
Ryuzo Kato, Kyoto, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Sept. 17, 1971, Ser. No. 181,311

Claims priority, application Japan, Sept. 19, 1970, 45/82324

Int. Cl. H01j 29/02, 31/26, 31/38

U.S. Cl. 313—65 R 4 Claims



A target assembly of an image pick-up tube including a face plate hermetically fastened on one open end of a tubular envelope of the image pick-up tube through pressure welded binding member composed of indium which is interposed therebetween. A support member supporting therein a target substrate is mounted on the inner surface of the face plate and secured thereto through its peripheral wall combined with the binding member. On the peripheral wall is formed a groove extending circumferentially thereof. The binding member combines with the groove so that the support member favorably fastened to the face plate.

3,714,489

MULTIBEAM SINGLE GUN ELECTRON DISCHARGE DEVICE

Alfred D. Johnson; Donald L. Say, and Harry E. Smithgall, all of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated

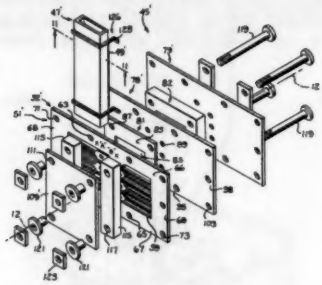
Continuation-in-part of Ser. No. 860,621, Sept. 24, 1969, abandoned. This application March 22, 1971, Ser. No. 126,609

Int. Cl. H01j 29/02, 29/50, 19/42

U.S. Cl. 313—69 R 12 Claims

An electron discharge device, such as a high resolution cathode ray tube, utilizes an array of electron beams provided by a multibeam single electron gun structure. The plurality of

beams emanating from a common emission plane are separately modulated by a planar arrangement of separate control electrode members each having a beam aperture therein forming an aperture array. At least one accelerating-



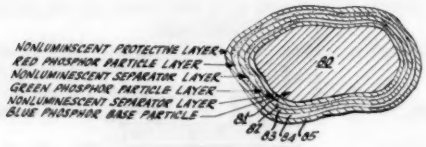
collimating electrode plane having a similar array of apertures is oriented in spaced and substantially parallel relationship with the control grid plane to provide a collimated array of beams directed to impinge the cathodoluminescent screen in a defined pattern array.

3,714,490

LUMINESCENT SCREEN COMPRISING PHOSPHOR CORES LUMINESCENT IN FIRST COLOR AND PHOSPHOR COATINGS LUMINESCENT IN SECOND COLOR

Ray D. Kell, Princeton, N.J., assignor to RCA Corporation

Division of Ser. No. 108,534, May 8, 1961. This application Aug. 24, 1964, Ser. No. 391,565
Int. Cl. H01j *29/26, 63/04, 31/20*
U.S. Cl. 313—92 R **6 Claims**



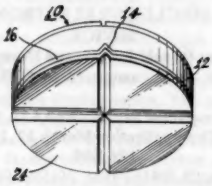
A luminescent screen comprises a substrate and a layer of coated particles on said substrate, each coated particle comprising a base particle of a first phosphor luminescent in a first color and a coating on the base particle including a second phosphor luminescent in a second color.

3,714,491

QUADRANT PHOTODIODE

Robert John McIntyre, Pointe Claire, and Howard Charles Springings, Chateauguay, both of Canada, assignors to RCA Limited, Montreal, Quebec, Canada

Filed April 13, 1970, Ser. No. 27,618
Int. Cl. H01j *39/06*; H01l *15/06*
U.S. Cl. 313—96 **7 Claims**



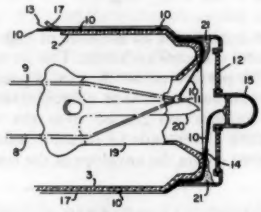
A quadrant photodiode including a flat substrate of high resistivity semiconductor material, such as silicon, of one conductivity type having a thin region of the one conductivity type within and extending across one surface thereof and four quadrant shaped regions of the opposite conductivity type in its other surface. The quadrant shaped regions are arranged in a circle with the straight edges of adjacent quadrants being in closely spaced relation. The surface of the substrate having the one conductivity type region therein is provided with V-shaped grooves which are directly opposed to and extend along the spaces between the edges of the quadrant-shaped regions. The surfaces of the grooves serve to refract the light which is incident on the surface toward the quadrant-shaped regions so as to prevent optical cross-talk between the quadrant-shaped regions.

3,714,492

DC FLUORESCENT LAMP WITH IMPROVED EFFICIENCY

William J. Roche, Merrimac, Mass., assignor to GTE Sylvania Incorporated

Filed May 3, 1971, Ser. No. 139,552
Int. Cl. H01j *1/62*
U.S. Cl. 313—108 R **8 Claims**



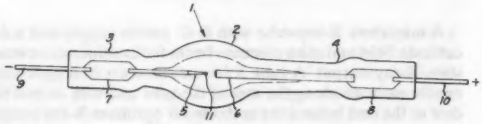
A DC fluorescent lamp unit in which resistance wire is wound about the tubular lamp envelope for providing a temperature gradient along the length of the lamp which is operative to shift higher the bounds of the mercury vapor pressure gradient within the lamp envelope. A protective covering of insulation is provided by encasing the wire wound lamp envelope in clear plastic. The resistance wire winding may be connected to one of the lamp electrodes to additionally serve as a series ballast for the lamp.

3,714,493

COMPACT METAL HALIDE ARC LAMP CONTAINING PRIMARILY MERCURY IODIDE

Elmer G. Fridrich, Chardon, Ohio, assignor to General Electric Company

Filed April 6, 1970, Ser. No. 25,672
Int. Cl. H01j *61/20*
U.S. Cl. 313—184 **7 Claims**



A compact very high brightness arc lamp operating with near molten electrode tips and using mercury iodide as the discharge medium, preferably with an excess of iodine. In the pressure range from 5 to 20 atmospheres, mercury iodide produces a high ratio of ultraviolet to visible radiation making the lamp particularly suitable for photochemical applications requiring a point source for high definition. As the pressure is increased, the spectrum first exhibits pronounced blue and green lines of mercury, and then gradually more red. At very high pressures in the range from 100 to 150 atmospheres, white light is produced with a sun-like continuum.

3,714,494

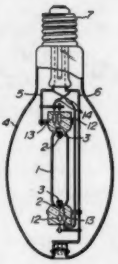
HIGH-PRESSURE MERCURY VAPOR HALIDE LAMP HAVING A REFRACTORY METAL CYLINDRICAL AUXILIARY ELECTRODE

Noboru Nakamura, Shoki-so, 397, Oaza Nishiiyozumi, Takatsuki-shi, Japan

Continuation of Ser. No. 840,812, July 10, 1969, abandoned, which is a continuation of Ser. No. 581,911, Sept. 26, 1966, abandoned. This application Feb. 8, 1971, Ser. No. 113,653

Int. Cl. H01j *61/54*

U.S. Cl. 313—198 8 Claims



A high pressure mercury vapor halide lamp provided with an auxiliary electrode formed by a roughly continuous cylinder of a refractory metal wire spirally and coaxially surrounding and covering a greater portion of the main electrode. The advantage is low ignition voltage, especially low reignition voltage.

3,714,495

CIRCUIT ARRANGEMENT INCLUDING AN AUXILIARY COIL FOR GENERATING A MAGNETIC FIELD PERIODICALLY VARYING WITH TIME AND BEING ADJUSTABLE IN AMPLITUDE

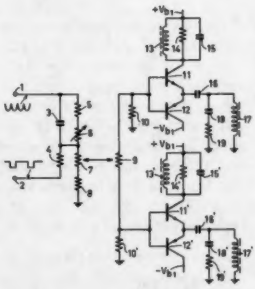
Antonius Boekhorst, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 4, 1970, Ser. No. 43,369

Claims priority, application Netherlands, June 7, 1969, 6908715

Int. Cl. H01j *29/46*

U.S. Cl. 315—13 C 14 Claims



A circuit for clamping a magnetic field, such as a television convergence field has a main coil with A.C. current applied to it for generating part of the field. An auxiliary coil is wound on the same core and has applied to it a D.C. current that has a value equal to the average of the A.C. current. Therefore, an extreme value of the resultant field is clamped.

3,714,496

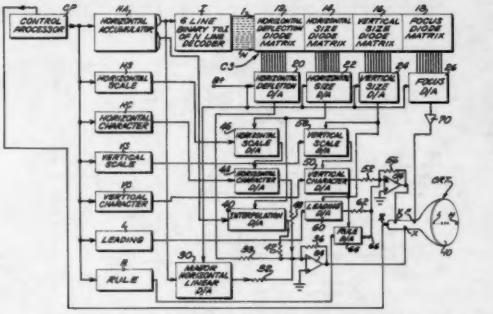
COMPENSATION FOR GRAPHICAL IMAGE DISPLAY SYSTEM FOR COMPENSATING THE PARTICULAR NON-LINEAR CHARACTERISTIC OF A DISPLAY

Robert M. Horvath, Cleveland, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Oct. 7, 1970, Ser. No. 78,655

Int. Cl. H01j *29/70*

U.S. Cl. 315—18 17 Claims



A display system is provided for displaying graphical images on a radiant energy-responsive surface, such as that of a cathode ray tube, with a radiant energy beam which is displaced to a plurality of different image positions on the surface under the control of a position storage means for registering various digital representations respectively representative of a plurality of image positions. A compensating signal supply serves to supply various compensating digital representations which are respectively representative of the compensation required at the various image positions. Depending on the digital representations in the position storage means, the signal supply is controlled to provide a particular coded pattern of compensating digital signals. These compensating digital signals are then converted into analog compensating signals for compensating for a particular non-linear characteristic of the display system.

3,714,497

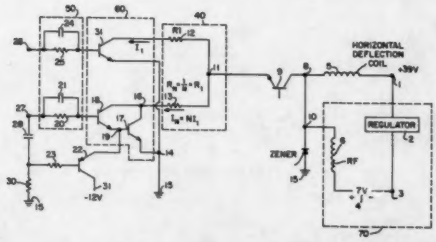
CATHODE RAY TUBE DEFLECTION SYSTEM

Byron M. Cole, 555 Pine Tree Road, Jenkintown, Pa.

Filed Oct. 15, 1970, Ser. No. 81,077

Int. Cl. H01j *29/70*

U.S. Cl. 315—19 8 Claims

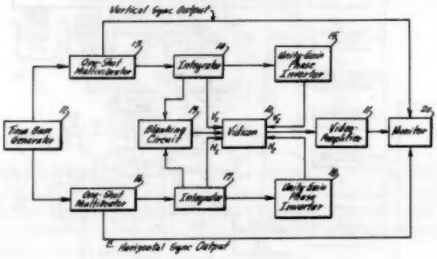


A cathode ray tube deflection system which consists of a series of weighted current steps utilizing switches to drive a deflection coil directionally sweeping over a screen. A transistor isolates the deflection coil from the switches. When a switch activates or closes, the transistor saturates and the current through the deflection coil rises linearly. The current through the deflection coil is limited to that determined by the current summation through resistor circuits connected to the switches or input terminals. The amount of current passage through the deflector coil determines the amount of movement over the screen.

3,714,498
TELEVISION CAMERA

William H. Woodworth, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 16, 1970, Ser. No. 11,492
Int. Cl. H01j 29/70
U.S. Cl. 315—19 3 Claims

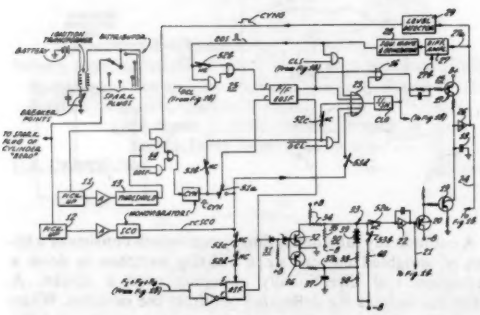


A television camera having an electrostatic rather than electromagnetic deflection system. The camera comprises a time-base generator which supplies separate pulses to the vertical and horizontal deflection circuits, each of which has a monostable multivibrator, an integrator and a unity-gain phase inverter. The tube output is amplified by a three-stage, two-pole response per stage, amplifier.

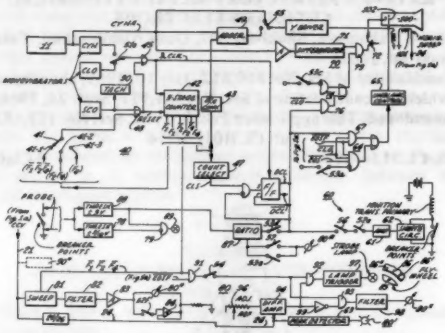
3,714,499
SYSTEM FOR TESTING THE IGNITION OF AN INTERNAL COMBUSTION ENGINE

Edmond R. Pelta, Pacific Palisades, and Kenneth Stewart Gold, Canoga Park, both of Calif., assignors to Autoscan, Inc., Culver City, Calif.

Division of Ser. No. 556,710, June 10, 1966, Pat. No. 3,619,767. This application May 15, 1970, Ser. No. 37,812
Int. Cl. H01j 29/70
U.S. Cl. 315—22 16 Claims



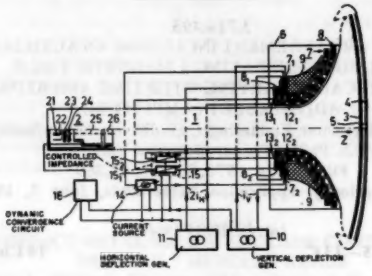
This invention relates to a system for providing a controlled sweep of a beam in accordance with a variable rate of recurrence of a particular phenomenon. The rate of sweep is adjusted so that the sweep occurs during a particular portion of the time between successive recurrences of the particular phenomenon. The retrace occurs during the remaining portion of the time between successive recurrences of the particular phenomenon.



3,714,500
COLOR TELEVISION DISPLAY DEVICE

Johannes Kaashoek, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 22, 1970, Ser. No. 48,092
Claims priority, application Netherlands, June 27, 1969, 6909887
Int. Cl. H01j 29/70
U.S. Cl. 315—24 18 Claims



A color television display device provided with two systems of deflection coils formed with symmetrical coil halves and with a correction circuit for correcting the deflection errors caused by the anisotropic astigmatism of the systems of coils. The coil halves of at least one system of deflection coils are provided with at least one tapping which form part of the correction circuit in which in parallel with the number of turns located between one tapping and one end and a different tapping of a coil half a line and field frequency controlled current source or impedance and an impedance only controlled at the line frequency, respectively, are connected.

3,714,501
LINEARITY CORRECTION FOR MAGNETICALLY DEFLECTABLE CATHODE RAY TUBES

Fred W. Erickson, Northridge, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

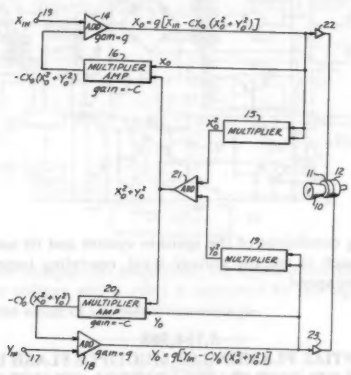
Filed Nov. 26, 1971, Ser. No. 202,445
Int. Cl. H01j 29/76
U.S. Cl. 315—24 4 Claims

Apparatus is provided for correcting output signals to the yoke of a CRT. The output signals are corrected in a feedback

loop and recombined with the input signals in accordance with the algorithms

$X_o = g[X_{in} - CX_o(X_o^2 Y_o^2)]$ and

$Y_o = g[Y_{in} - CY_o(X_o^2 Y_o^2)]$



where X_o and Y_o are the output signals for the X and Y yokes of the CRT, X_{in} and Y_{in} are the uncorrected input deflection signals, and g and C are gain constants associated with the apparatus.

3,714,502

CIRCUIT FOR CONTROLLING AN INTENSITY OF A SCANNING IN AN ELECTROMAGNETIC DEFLECTION TYPE CATHODE RAY TUBE

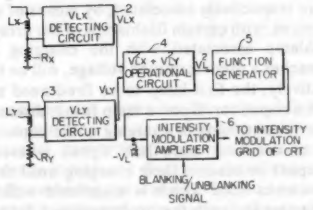
Kazuhiro Hirayama, Tokyo, Japan, assignor to Iwatsu Electric Company Limited, Tokyo, Japan

Filed June 16, 1970, Ser. No. 46,611

Claims priority, application Japan, June 16, 1969, 44/46833; Aug. 1, 1969, 44/60381

Int. Cl. H01j 29/52

U.S. Cl. 315—30 **4 Claims**



A circuit for controlling an intensity of a scanning in an electromagnetic deflection type cathode ray tube generates an unblanking pulse only when a current change exists in a deflection coil of the cathode ray tube. The unblanking pulse is applied to an intensity modulation grid of the cathode ray tube thereby a fluorescent surface is maintained in an unblanking condition when the current change exists in a deflection coil and in a blanking condition when no current change exists in a deflection coil. As a result of this, an intensisty of a scanning can be in constant brightness independent of the scanning velocity and further, a burning of the fluorescent surface of the cathode ray tube can be prevented in case movement of a brightness spot is stopped.

3,714,503

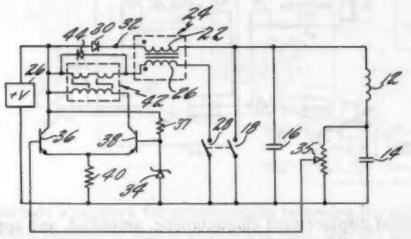
RESONANT ENERGY RECOVERY TYPE CRT DEFLECTION CIRCUIT

Roger F. West, Weston, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 21, 1970, Ser. No. 100,232

Int. Cl. H01j 29/70

U.S. Cl. 315—27 TD **5 Claims**



A winding coupled to the input choke of a resonant energy recovery type deflection circuit with a disconnect diode in series with the choke enables use of a power supply voltage for the circuit which is much lower than what has heretofore been required due to the need to maintain sweep current and flyback voltage at acceptable levels. Another embodiment includes a transductor and a difference amplifier to regulate the deflection circuit yoke capacitor voltage so that raster size remains constant. The circuit is thereby immune to component and power supply voltage variations. Both embodiments utilize mostly elements which are substantially non-dissipative.

3,714,504

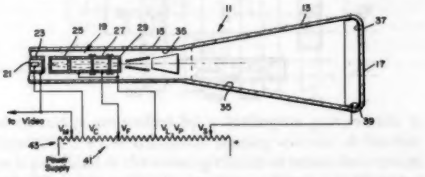
ELECTRON OPTIC SYSTEM UTILIZING A FOCUSING ELECTRODE HAVING A MORE POSITIVE VOLTAGE THAN THE TWO ADJACENT ELECTRODES

Kurt Amboss, 30181 Cuthbert Road, Malibu, Calif.

Filed Oct. 20, 1970, Ser. No. 82,477

Int. Cl. H01j 29/56

U.S. Cl. 315—31 R **5 Claims**



A system wherein spherical aberration is reduced in an electron-optic device having post deflection acceleration by connecting the focusing electrode of an "einzel" type electrostatic electron lens to a unitary source of potentials at a potential more positive than the potential connected to the electrodes disposed on either side of the focusing electrode. In every case, the same supply above mentioned provides all the potentials necessary to operate the device.

3,714,505

DYNAMIC FOCUS CORRECTION APPARATUS FOR A RECTILINEARLY RASTER SCANNED ELECTRON BEAM

Michael Edward Lukacs, Long Branch, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

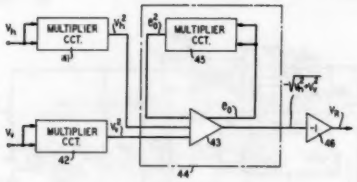
Filed Dec. 1, 1970, Ser. No. 93,944

Int. Cl. H01j 29/56

U.S. Cl. 315—31 **13 Claims**

To maximize the resolution of a rectilinearly raster scanned electron beam over the entire image area of a cathode ray

tube, the signals from the horizontal and vertical deflection circuits are combined vectorially to obtain a voltage proportional to the radial distance of the focused spot from the center of the tube face. This voltage is then shaped, by a diode function generator so as to match the tube's focus voltage versus radial displacement characteristic, amplified, and applied to the focus element of the tube. As the scan spot moves in a rectilinear raster pattern the signal applied to the tube's focus element is continuously altered in a manner such that optimum focusing is always achieved.

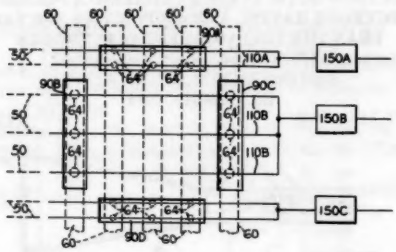


3,714,506

DISPLAY PANEL INCLUDING SCANNING CELLS AND FIXED FORMAT DISPLAY CELLS

George A. Kupsky, Milford, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 6, 1970, Ser. No. 61,644
Int. Cl. H01j *17/36*
U.S. Cl. 315—84.6 **12 Claims**



A display panel comprises a plurality of gas-filled cells arranged in rows and columns and including electrode means for firing said cells in a predetermined pattern. The panel also includes a mask having a pattern of openings and overlaying the cells so that the glow of selected cells glowing through selected ones of said openings provides a display of a character.

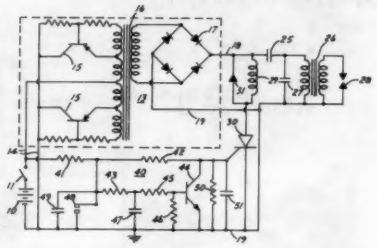
3,714,507

CONTROLLED VARIABLE SPARK CAPACITOR DISCHARGE IGNITION SYSTEM

John C. Schweitzer, and Edward M. Junak, both of Grand Junction, Colo., assignors to Delta Products, Inc., Grand Junction, Colo.

Filed March 2, 1971, Ser. No. 120,125
Int. Cl. H01t *15/02*; F02p *3/06, 5/04*
U.S. Cl. 123—148 E **16 Claims**

A capacitor discharge type ignition system is arranged to deliver pulses of energy to the distributor of an engine, thereby to generate ignition sparks. A control circuit is provided for controlling the duration of the energy pulses, and hence the duration of ignition sparks, as a function of selected operating conditions of the ignition system and its associated engine, such as, supply voltage level, operating temperature and engine speed.

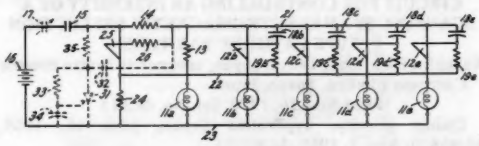


3,714,508

SEQUENTIAL FLASHING OF MULTIPLE FLASH LAMPS BY LOW COST STATIC CONTROL CIRCUIT OF INTEGRATED DESIGN

John D. Harnden, Jr.; William P. Kornrumpf, both of Schenectady, and Robert A. Marquardt, Baldeinsville, all of N.Y., assignors to General Electric Company

Continuation of Ser. No. 784,067, Dec. 16, 1968, abandoned. This application Feb. 22, 1971, Ser. No. 117,774
Int. Cl. H05b *57/00, 39/00*
U.S. Cl. 315—241 **12 Claims**



Electronic circuitry for sequentially firing photoflash lamps of an array of multiple flash lamps. The circuitry comprises means for causing capacitors to be charged, at different rates of charging, upon the occurrence of a start-flash signal. These capacitors are respectively associated, by means of solid state switching devices, with certain flashlamps of the array, and the unfired flashlamp associated with the charging capacitor which first reaches a predetermined voltage, will be the first to fire. Alternatively, the first lamp to be fired need not be associated with a capacitor. Upon a lamp firing, disenabling circuitry causes discontinuing of charging of the capacitors until occurrence of the next start-flash signal, whereupon the capacitors repeat or resume their charging until the unfired flashlamp becomes fired which is associated with the next charging capacitor to reach the predetermined firing voltage. The procedure is repeated for causing sequential firing of all flashlamps in the array. Circuit modifications and alternative embodiments disclosed, including a single-capacitor circuit.

3,714,509

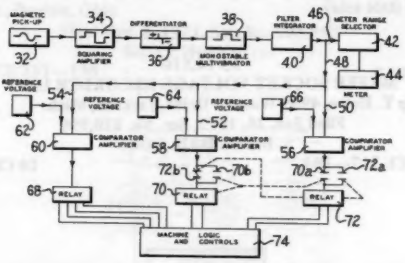
INERTIA WELDER SPEED CONTROL DEVICE

Donald F. Coleman, Dunlap, and Robert G. Miller, Metamora, both of Ill., assignors to Production Technology Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 791,440, Jan. 15, 1969, abandoned. This application May 7, 1971, Ser. No. 141,230
Int. Cl. G01p *3/48*
U.S. Cl. 317—5 **27 Claims**

An inertia welder speed switch assembly in which a signal is sensed by a magnetic pickup and is then passed through a

squaring amplifier, differentiator, monostable multivibrator, filter integrator, and a plurality of comparator amplifiers. In



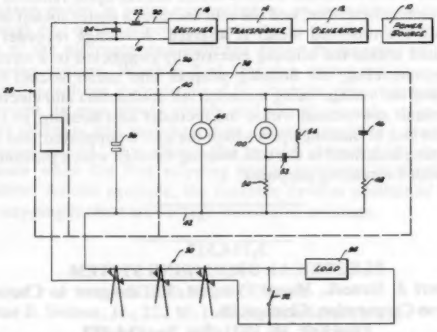
each of the comparator amplifiers, the signal is compared to a reference voltage and a relay is operated by the signal as it reaches the value of the reference voltage.

3,714,510

METHOD AND APPARATUS FOR IGNITION OF CROSSED FIELD SWITCHING DEVICE FOR USE IN A HVDC CIRCUIT BREAKER

Gunter A. G. Hofmann, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed March 9, 1971, Ser. No. 122,397
Int. Cl. H02h *7/00*; **H01j** *17/26*
U.S. Cl. 317—11 A **5 Claims**



Ignition method and apparatus for crossed-field switching device for onswitching the device when a high voltage is applied thereacross, comprising applying a plasma puff between the electrodes to initiate arc discharge therebetween, followed by resonantly reducing the current to zero to extinguish the arc and permit initiation of glow mode discharge after the current zero.

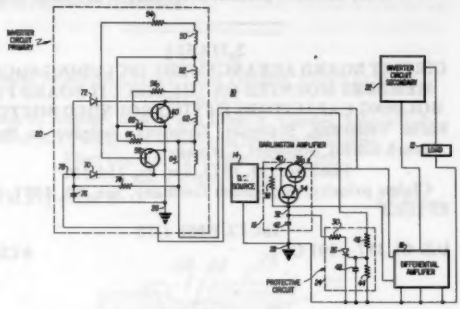
3,714,511

POWER SUPPLY PROTECTION CIRCUIT

Charles Nelson Fendrich, Jr., Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed April 10, 1972, Ser. No. 242,541
Int. Cl. H02h *7/10*
U.S. Cl. 317—22 **10 Claims**

A circuit is disclosed for protecting a power supply including a Royer type inverter circuit from damage due to overloading. The protective circuit includes a capacitor for triggering a normally non-conductive silicon controlled rectifier in response to an increase in voltage across the switching transistors of the Royer circuit caused by overloading. When triggered, the silicon controlled rectifier reduces the output of a Darlington amplifier, which in turn reduces the power delivered to the switching transistors. The protective circuit



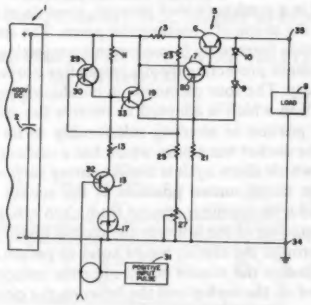
may include a network for automatically returning the silicon controlled rectifier to its non-conductive state, thereby restoring normal operation of the overall power supply circuit.

3,714,512

PROTECTION CIRCUIT FOR TRANSISTOR MODULATORS

Stanley J. Grabowski, Fayetteville, N.Y., assignor to General Electric Company

Continuation of Ser. No. 127,905, March 25, 1971, abandoned. This application April 6, 1972, Ser. No. 241,856
Int. Cl. H02h *3/20*; **G05f** *1/58*
U.S. Cl. 317—33 VR **1 Claim**



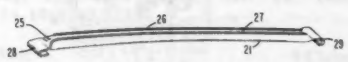
A load circuit is controlled by a darlington pair, which in turn is controlled by a transistor sensing circuit. A further transistor is provided in the sensing circuit to sense the current flow to the load. When excess current is flowing to the load this additional transistor will cause the sensing circuit to turn the darlington pair off, therefore limiting the amount of current flow to the load.

3,714,513

PRINTED CIRCUIT CARD RETAINER AND RACK ASSEMBLY

Joseph Marconi, 428 S. Jensen Road, Vestal, N.Y.

Filed Sept. 1, 1971, Ser. No. 176,837
Int. Cl. H02b *1/02*
U.S. Cl. 317—101 DH **4 Claims**



A printed circuit card retainer and rack assembly is described. The retainers comprise resilient arcuate channel

members of chamfered U-shaped cross section permitting vertical alignment of cards of diverse thickness. The retaining force exerted by the resiliency and deformation of the members is in the direction parallel to the face of the card.

3,714,514

CIRCUIT BOARD ARRANGEMENT INCLUDING SOCKET MEMBERS MOUNTED ON THE CIRCUIT BOARD FOR HOLDING CAPACITORS HAVING ROUNDED BOTTOMS

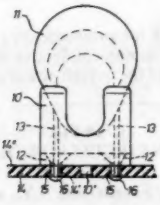
Karin Vesterling, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 30, 1971, Ser. No. 214,310

Claims priority, application Germany, Jan. 23, 1971, P 21 03 158.3

Int. Cl. H05k 1/18

U.S. Cl. 317—101 C **4 Claims**



A device for mounting electrical components having spherical or tear-shaped portions and having leads, particularly tantalum electrolytic capacitors, on one side of a circuit board having a mounting surface and having a plurality of holes arranged in a predetermined manner, consists of a plastic socket having the shape of a rectangular prism. The socket has a nesting portion formed by four elements projecting from the base, one element projecting from a respective corner of the rectangular base. The four elements, in combination, form the nesting portion which is adapted to receive the spherical or tear-shaped portion in abutting relationship in its mounted position. The socket has a base which has a surface corresponding to and which abuts against the mounting surface of the circuit board in the mounted position of the socket. The socket is provided with openings spaced from each other to correspond to the spacing of the holes in the circuit board for passing the leads through the circuit board holes to permit the leads to be connected to the circuit board after the component has been mounted on the socket and the latter on the circuit board.

3,714,515

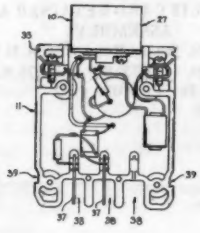
HOUSING ASSEMBLY OF MODULAR CONSTRUCTION FOR SOLID STATE RELAYS WITH PLURAL EXTERNAL TERMINALS

Art Lee, El Paso, Ill., assignor to General Electric Company

Filed Sept. 20, 1971, Ser. No. 182,058

Int. Cl. H02b 1/08; H05k 7/20

U.S. Cl. 317—118 **8 Claims**



A housing of modular construction, preferably for use in solid state unit pole relays, comprising a multi-purpose molded cap capable of being used either by itself in pairs to form a complete enclosure for the circuitry of a power pole of a solid state relay, or in pairs in conjunction with a central core to form the enclosure for the circuitry of a driver unit of a solid state relay.

3,714,516

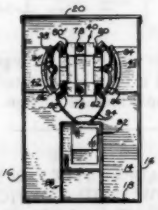
METER SOCKET VOLTAGE RECORDER UNIT

Philip T. Howe, 4939 Warsaw Drive, Jackson, Mich.

Filed Jan. 26, 1972, Ser. No. 220,999

Int. Cl. H02b 9/00

U.S. Cl. 317—104 **10 Claims**



The invention pertains to apparatus for monitoring metered electrical voltage to determine the possible existence of voltage fluctuations in electrical power supplied to customers by electric utility companies. The voltage recorder unit consists of a housing having an exteriorly projecting adapter receivable within a conventional electric meter socket upon removal of the meter therefrom, and the unit includes a meter socket into which the removed meter is inserted. A voltage recorder is located within the housing electrically connected to a circuit interconnecting the housing adapter and meter socket for sensing the voltage being metered. All conductors and electric terminals are located within the recorder unit housing, or the meter box or housing upon which the unit is supported, and an opening is defined in the unit housing through which the meter extends for reading purposes.

3,714,517

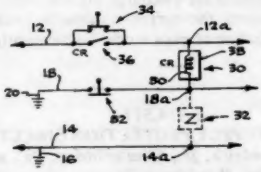
ELECTRICAL GROUNDING SYSTEM

Robert J. Stracek, Mount Prospect, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Filed Feb. 10, 1971, Ser. No. 114,132

Int. Cl. H02h 3/14

U.S. Cl. 317—123 **11 Claims**



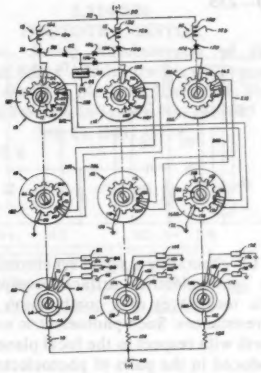
An improved ground protecting circuit designed to require grounding of the chassis of electrical apparatus for continued operation of the apparatus after a switch, which has been closed to initiate the operation of the apparatus through the ground protecting circuit, is opened.

3,714,518

ELECTROMECHANICAL STEPPING MECHANISM FOR POSITIONING LOAD DEVICES

David Brian Mohler, West Milton, Ohio, assignor to Ledex, Inc., Dayton, Ohio

Filed Dec. 8, 1971, Ser. No. 205,893
Int. Cl. H01h 47/14
U.S. Cl. 317—139 7 Claims



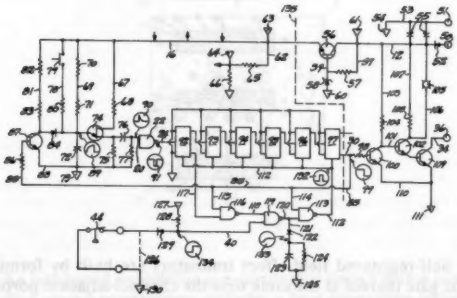
An electromechanical mechanism for selectively positioning a plurality of movable devices comprises a plurality of rotary stepping motors, there being one stepping motor for driving each of said movable devices. Each stepping motor also drives a pair of oppositely acting alternate step switches. Each stepping motor is series connected to an operating voltage through one of the alternate step switches which it drives and one of the alternate step switches driven by another of the stepping motors. When a first stepping motor receives an operating voltage it steps one of its alternate step switches to interrupt its own power supply and simultaneously steps its other alternate step switch to close a power supply to a second stepping motor. This allows the second stepping motor to operate while the first stepping motor resets to its starting position. As one example, the movable devices positioned by the stepping motors are voltage distributor switches.

3,714,519

SOLID STATE TIMER

Jessie D. Swinea, Jr., 222 W. LaSalle, Royal Oak, Mich.

Filed Oct. 5, 1970, Ser. No. 78,007
Int. Cl. H01h 47/18
U.S. Cl. 317—141 S 18 Claims



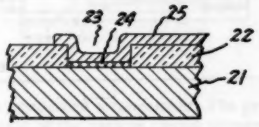
A solid state timer powered by a direct current source and including means for generating pulses at timed intervals for delivery to a shift register including a series of flip-flop solid state units and operative after application thereto of a predetermined number of pulses to change its condition and thereby activate a controlled unit. Reset means respond to each activation of said shift register means to restore it to condition to repeat its operation.

3,714,520

HIGH TEMPERATURE LOW OHMIC CONTACT TO SILICON

William E. Engeler, Scotia, and Linus F. Cordes, Schenectady, both of N.Y., assignors to General Electric Company

Filed Dec. 15, 1970, Ser. No. 98,266
Int. Cl. H01l 3/00
U.S. Cl. 317—234 R 4 Claims



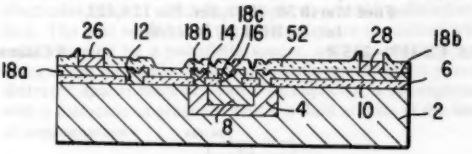
A high temperature low ohmic electrical contact is made to a silicon body by forming a very thin layer of silicon carbide over the silicon body and then forming a metallic layer, such as a refractory metal, over the silicon carbide to form a high quality low ohmic contact to the surface of the silicon body.

3,714,521

SEMICONDUCTOR DEVICE OR MONOLITHIC INTEGRATED CIRCUIT WITH TUNGSTEN INTERCONNECTIONS

Joseph Michael Shaw, Cranbury, N.J., assignor to RCA Corporation

No Drawing. Filed July 26, 1971, Ser. No. 166,012
Int. Cl. H01l 5/00
U.S. Cl. 317—234 R 5 Claims



The tungsten interconnections are coated with platinum where leads are to be attached. The device or circuit is sealed with a layer of silicon nitride or other protective insulating material which has no openings at or near the P-N junctions which extend to the surface of the semiconductor chip.

3,714,522

SEMICONDUCTOR DEVICE HAVING SURFACE ELECTRIC-FIELD EFFECT

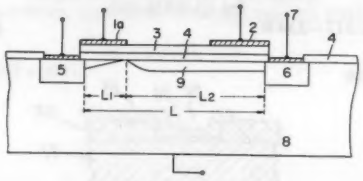
Yoshio Komiya, Tokyo, Japan; John L. Moll, Stanford, Calif., and Yasuo Tarui, Tokyo, Japan, assignors to Kogyo Gijutsuin (a/k/a)"Agency of Industrial Science and Technology, Ministry of International Trade and Industry, Japanese Government", Tokyo-to, Japan

Filed Nov. 13, 1969, Ser. No. 876,315
Claims priority, application Japan, Nov. 14, 1968, 43/82815; Nov. 14, 1968, 43/82816
Int. Cl. H01l 11/14
U.S. Cl. 317—235 R 9 Claims

A semiconductor device comprising a semiconductor, an insulating layer and a resistive or half conducting layer which are provided on the surface of said semiconductor, and a metallic electrode adjoined to said latter layers and having

such a surface electric-field effect as that any potential distribution is established on said insulating layer, said effect causing multiplication and increase of the functional ability of the semiconductor device, whereby for example, effective utilization of the device as an amplifier comprising a high frequency, surface electric-field effect transistor, a high speed switching transistor or tetrode is made possible.

Furthermore, a semiconductor device having the same structure as mentioned above except that the insulating layer

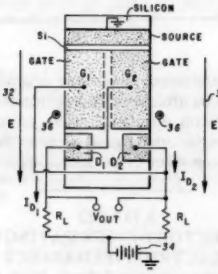


and resistive layer or half conducting layers are made of a material capable of transmitting an input light ray therethrough and mutual interaction between the input light ray and said semiconductor is skillfully utilized for effective multiplication of the functional ability of the semiconductor device, whereby, for example, effective utilization of the device as a light detector, a surface photo transistor, a surface light generating element control of which is attained by gate voltage, or a surface light modulator is made possible.

3,714,523
MAGNETIC FIELD SENSOR

Robert Thomas Bate, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed March 30, 1971, Ser. No. 129,422
Int. Cl. H01l *11/14*, *15/00*
U.S. Cl. 317—235 R **8 Claims**

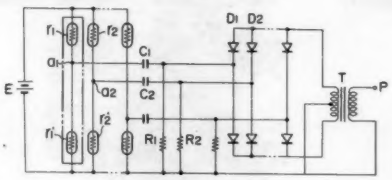


Disclosed is an insulated gate field effect transistor (IGFET) structure, the electrical state of which is strongly sensitive to the presence of a magnetic field. The structure is defined by a semiconductor substrate having a source diffusion region and two drain diffusion regions spaced therefrom. Two adjacent gate electrodes are formed intermediate the source and drain regions. The two gates are biased to form two inversion layers in the semiconductor material thereunder. Magnetically induced charge coupling between the two inversion layers provides positive feedback during operation and thus effects an extremely sensitive magnetic field detector.

3,714,524
DEVICE FOR GENERATING A SIGNAL SYNCHRONOUS WITH FOCUSING

Yoshihisa Katsuyama, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 16, 1971, Ser. No. 208,638
Claims priority, application Japan, Dec. 22, 1970, 45/115210
Int. Cl. H01j *3/14*
U.S. Cl. 250—235 **2 Claims**

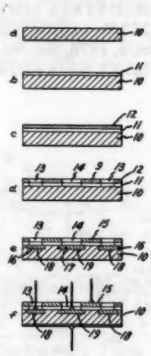


A device for generating a signal synchronous with focusing includes a photoelectric surface comprising pairs of photoelectric resistances or a combination of photoelectric diodes and resistances. Such photoelectric surface is vibrated back and forth with respect to the focal plane of a lens so that outputs produced in the pairs of photoelectric resistances or the combination of photoelectric diodes and resistances are subjected to full-wave rectification by rows of diodes and thereafter summed up by a transformer. Thus, a signal synchronous with the point of time at which the photoelectric surface is coincident with the focal plane of the lens may be obtained at the secondary winding of the transformer.

3,714,525
FIELD-EFFECT TRANSISTORS WITH SELF REGISTERED GATE WHICH ACTS AS DIFFUSION MASK DURING FORMATION

Dale M. Brown, Schenectady; William E. Engeler, Scotia; Peter V. Gray, Scotia, and Marvin Garfinkel, Scotia, all of N.Y., assignors to General Electric Company

Division of Ser. No. 675,228, Oct. 13, 1967. This application March 2, 1970, Ser. No. 18,775
Int. Cl. H01l *5/00*
U.S. Cl. 317—235 R **5 Claims**



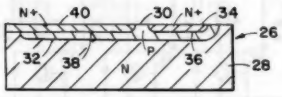
Self-registered field-effect transistors are built by forming the gate thereof at the same time the channel-adjacent portion of the source and drain regions are defined. In one embodiment a refractory metallic film is deposited over an insulating film and etched to form the gate. Subsequently, the metallic film may serve as a diffusion mask, although this is not essential. The metallic film is patterned by photoresist masking and

etching. The portion of the metallic film overlying the channel region of the semiconductor body thereof is used as a gate. As a result of simultaneous definition of the channel-adjacent portions of source and draining regions and patterning of the channel-aligned portions of the gate, when source and drain regions are formed by diffusion of activators into the silicon wafer, automatic registration of the gate-adjacent portions of the source and drain junctions beneath the gate is achieved.

3,714,526
PHOTOTRANSISTOR

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of, and David H. McCann, Linthicum, Md.

Filed Feb. 19, 1971, Ser. No. 116,777
Int. Cl. H01l *15/00*
U.S. Cl. 317—235 R **1 Claim**



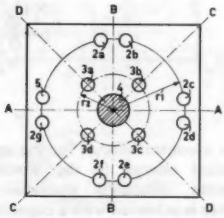
The invention described herein was made in the performance of work under a NASA Contract and is subject to the provisions of Section 305 of the National Aeronautics and Space Act of 1958, Public Law 85-568 (72 Stat. 435; 42 U.S.C. 2457).

A phototransistor in which there is included as a part of its integral structure an auxiliary diode in the form of an added base-collector junction which is formed in the surface of the base element and thus out of the direct path between the emitter and collector regions of the phototransistor.

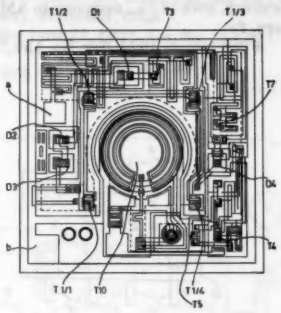
3,714,527
INTEGRATED MONOLITHIC SEMICONDUCTOR CIRCUIT WITH CONTROLLED CRYSTAL TEMPERATURE

Heiner Schmidt, Kielortplatz, Germany, assignor to U. S. Philips Corporation, New York, N.Y.

Filed July 12, 1971, Ser. No. 161,505
Claims priority, application Germany, July 29, 1970, P 20 37 636.7
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235 R **9 Claims**



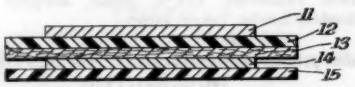
An integrated monolithic semiconductor circuit with a controlled crystal temperature includes a heat generating circuit element, a temperature sensor for the temperature sensing in the body, a plurality of temperature dependent circuit elements arranged symmetrically about a circle and at least one heat generating circuit element arranged symmetrically with respect to the circle. Feedback from the temperature sensing element to the control heat generating circuit provides a stable temperature controlled arrangement. The preferred symmetrical disposition of the various circuit elements on circles makes for an economical temperature control.



3,714,528
ELECTRICAL CAPACITOR WITH FILM-PAPER DIELECTRIC

Atlee G. Vail, Stamford, Vt., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jan. 13, 1972, Ser. No. 217,571
Int. Cl. H01g *1/01*
U.S. Cl. 317—258 **7 Claims**

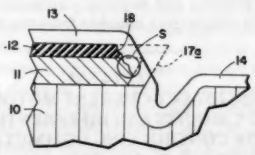


An electrical capacitor has a pair of convolutely wound electrodes, each of which has a mat surface and a polished surface. The mat surfaces of the electrodes are in contact with and separated by a polyolefin spacer, and the polished surfaces of the electrodes have a polyolefin spacer and a porous dielectric spacer therebetween. The capacitor is impregnated with a dielectric impregnant which is fluid at least at the time of impregnation.

3,714,529
THIN FILM CAPACITOR

Michael C. J. Cowpland, and David J. Dickinson, both of Ottawa, Ontario, Canada, assignors to Microsystems International Limited, Montreal, Quebec, Calif.

Filed May 4, 1971, Ser. No. 140,162
Int. Cl. H01g *1/14*
U.S. Cl. 317—261 **4 Claims**



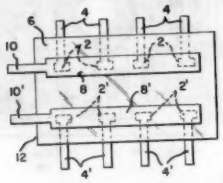
An improved mask-design for integrated circuit components having stepped layers of conductive material, — for example, thin-film capacitors. The mask is designed so that the step between the levels of the layer will be continuous and uniform, thereby ensuring electrical continuity across the layer.

3,714,530

VOLTAGE MULTIPLYING WAFER CAPACITOR

Richard Farner Wells, Elizabethtown, and Robert Eden Fry, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 6, 1971, Ser. No. 169,716
Int. Cl. H02m 7/24
U.S. Cl. 317—261 6 Claims



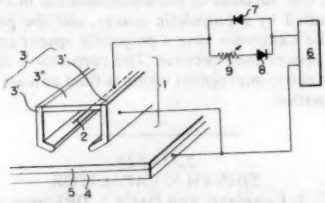
A wafer-type capacitor of the voltage multiplying type having a plurality of conducting secondary plates, with each of said plates in parallel with one of a pair of input primary plates, and with sheets of dielectric material interposed between the primary and secondary plates and combined with a dielectric adhesive to form a wafer configuration, wherein each secondary plate associated with one of the primary plates is directionally coupled to an opposed secondary plate associated with the other primary plate in order to provide a voltage multiplying capacitor in a wafer configuration.

3,714,531

AC CORONA DISCHARGER

Shinkichi Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 23, 1971, Ser. No. 155,876
Claims priority, application Japan, June 26, 1970, 45/56368
Int. Cl. H01t 19/00
U.S. Cl. 317—262 A 6 Claims



This invention provides an AC corona discharger provided with a shield, a corona discharging member, an electrode opposed to said discharging member, and a high-voltage AC source. The discharger has a controlling device for controlling the ratio of positive and negative components of the voltage applied to the discharging member from the AC source.

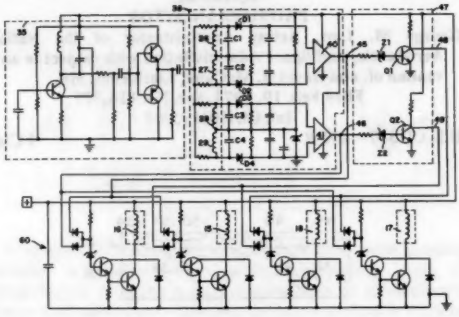
3,714,532

BRUSHLESS DIRECT CURRENT MOTOR INCLUDING RESONANT CIRCUITS AND DIFFERENTIAL AMPLIFIER FOR CONTROLLING COMMUTATION

Morris H. McCurry, Dayton, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 6, 1970, Ser. No. 87,502
Int. Cl. H02k 29/00
U.S. Cl. 318—254 6 Claims

In a brushless direct current motor, the commutation of current through the motor field windings is controlled by the voltage level across a plurality of sensing inductors mounted to detect the position of a metallic segment which rotates with the motor armature. The sensing inductors are supplied with a high frequency current from a fixed frequency oscillator, and changes in the resonance frequency of the inductors due to the proximity of the metallic segment causes the voltage across the inductors to change sharply. The voltage outputs from complementary inductors are applied to a differential



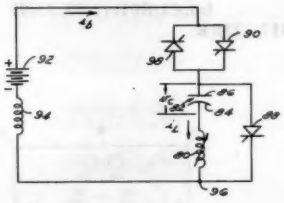
amplifier, and a change in voltage is sensed to control the current through the field windings. By comparing the outputs from complementary pairs of inductors simultaneously, the output from the differential amplifier is made substantially independent of the frequency and magnitude of the high frequency excitation current. Also, the sensing inductors are kept small and complementary coils are matched to minimize angular errors.

3,714,533

SINE PULSE CONTROLLER FOR VARIABLE RELUCTANCE MOTOR

Lewis E. Unnewehr, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed March 8, 1971, Ser. No. 121,653
Int. Cl. H02k 29/00
U.S. Cl. 313—254 1 Claim



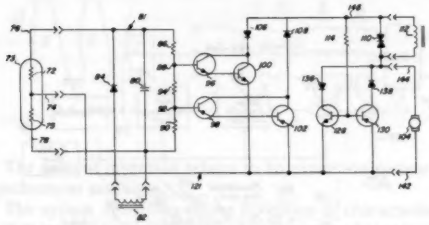
Described is a control circuit for the application of direct current electrical energy to the winding of a variable reluctance motor. Brushless operation of the variable reluctance motor is achieved with a capacitor connected in series with the motor winding. A first solid state switching device is connected in parallel with the series combination of the capacitor and motor winding, and a second solid state switching device is connected in series with this parallel combination. A source of electrical energy is connected across the above described elements. A third solid state switching device may be connected in antiparallel with the second solid state switching device. The controller may be used to supply substantially pure half-sine waves to the motor winding.

3,714,534

ELECTRICAL MOTOR-DAMPING CIRCUIT FOR A SELF-POSITIONING SYSTEM

Harvey Orlo Hoadley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1971, Ser. No. 139,329
Int. Cl. H02p 3/08
U.S. Cl. 318—368 7 Claims



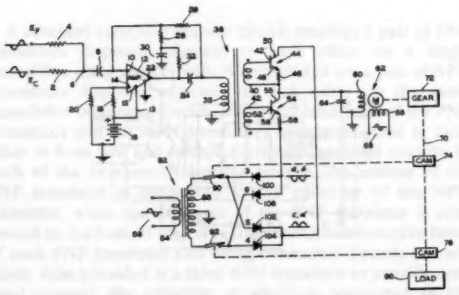
A damping circuit for a DC motor. Driving the motor is a half-wave rectified current from an AC power source. A transistor and isolating diode are connected across the motor terminals. The base of the transistor is connected through a resistor to the output of the AC power source so that during the half cycles the motor is not driven the transistor is turned on to short-circuit the back voltage from the motor due to armature rotation. The drag produced on the armature is proportional to its rotational velocity and therefore equivalent to hydraulic damping but less expensive and simpler. One such transistor circuit is used for each of the two directions of motor travel in a servo system such as used in automatic focusing projectors.

3,714,535

SERVO DISPLACEMENT LIMITER WITH REVERSING CAPABILITIES

Michael T. Krivak, Hasbrouck Heights, N.J.; Gibson Reynolds, Tuxedo Park, N.Y., and Frank Prapis, Paterson, N.J., assignors to The Bendix Corporation

Filed June 25, 1971, Ser. No. 156,635
Int. Cl. G05b 5/01
U.S. Cl. 318—468 7 Claims



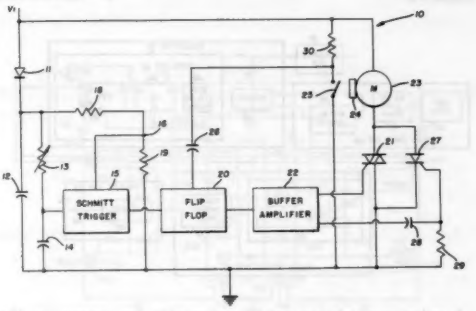
A servo system includes power turn-off, position and direction controlled limit switching for removing excitation to the servo motor at the stop position, while permitting reversing of rotational direction upon command, to eliminate heat generation and the necessity for dissipating the heat.

3,714,536

PUMP STROKE RATE AND MOTOR CONTROL

Arthur A. Foster, Mansfield, Ohio, assignor to The Gorman-Rupp Company, Mansfield, Ohio

Filed June 17, 1971, Ser. No. 154,041
Int. Cl. H02p 7/00
U.S. Cl. 318—470 13 Claims



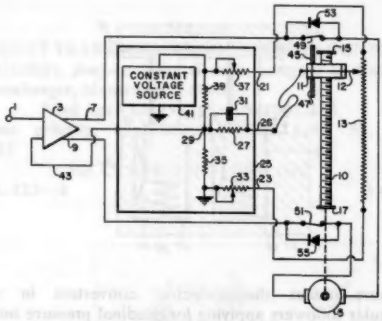
The repetition rate of the stroke of a positive displacement pump is regulated by controlling the current to a ramp generator in the form of a Schmitt trigger. The ramp generator energizes a flip flop which, through a triac, allows the AC motor of the pump to make one revolution whereupon a reed switch closes, changing the state of the flip flop and imposing a short burst of DC on the motor, effectively braking the same.

3,714,537

LIMIT CONTROL APPARATUS

Philip W. Bur, Warminsler, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed March 27, 1972, Ser. No. 238,180
Int. Cl. G05g 5/00
U.S. Cl. 318—626 8 Claims

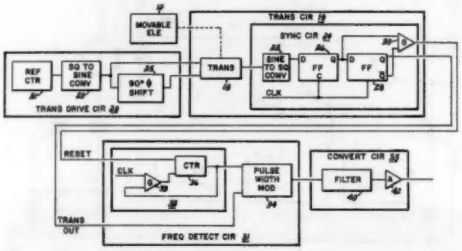


A servo system includes a servo motor which drives a controlled member. The controlled member has a slider and actuating members thereon. The slider moves across a slide-wire and provides a feedback signal representative of the position of the controlled member. An amplifier receives an input signal, representative of a process variable, and the feedback signal, and generates a difference signal, representative of the difference therebetween, for driving the servo motor. The actuating members trip limit switches as the controlled member reaches predetermined limits of travel. The limit switches are serially connected in the servo motor circuit and each is shunted by a diode. The diode allows a difference signal to be applied to the servo motor after its associated limit switch has been tripped, only if the difference signal is of a polarity which would effect the movement of the controlled member away from the tripped limit switch.

3,714,538
VELOCIMETER

George O. Albrecht, and Thomas E. Nead, both of Loveland, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sept. 13, 1971, Ser. No. 179,901
Int. Cl. H02m
U.S. Cl. 321—1 2 Claims

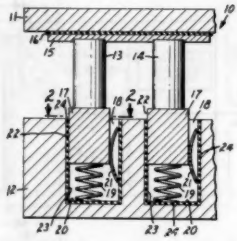


A velocimeter being readily adaptable for measuring the magnitude and direction of velocity of a moving element. A transducer is responsive to the moving element and produces an output signal having frequency variations proportional to the transducer velocity. A circuit is provided for measuring the variations in frequency and producing a DC output signal as a function thereof.

3,714,539
PRESSURE-CONTACT STRUCTURE FOR THERMOELECTRIC GENERATORS

Edward F. Hampl, Jr., St. Paul, Minn., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed June 24, 1971, Ser. No. 156,193
Int. Cl. H02m
U.S. Cl. 321—1.5 7 Claims



Pressure-contact thermoelectric converters in which rectangular followers applying longitudinal pressure on thermoelectric legs are also biased laterally against walls defining recesses in which the followers slide. More than one follower may be in each recess to improve the compactness of the converters.

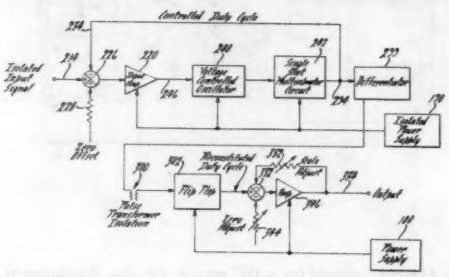
3,714,540
ISOLATION AND TRANSFORMING CIRCUIT

James H. Galloway, New Baltimore, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

Filed Nov. 10, 1970, Ser. No. 88,340
Int. Cl. H02m ; H03k 5/20; G01r 19/22
U.S. Cl. 321—2 20 Claims

A combination isolating and transforming circuit which consists primarily of three sections, a peak current limiting section and current and voltage isolation sections which electrically isolate the control circuit from the circuit being monitored. The input from the circuit to be measured, either from a bus bar or from a shunt resistor, drives an operational amplifier which controls a variable frequency oscillator. The pulses from this oscillator drive a single-shot multivibrator, the output of which is fed back to the operational amplifier as a negative feedback system.

The operational amplifier, in turn, changes its output to adjust the frequency of the oscillator so that duty cycle of the output of the multivibrator has an on-off ratio as a function only of the input signal to the circuit. As this multivibrator



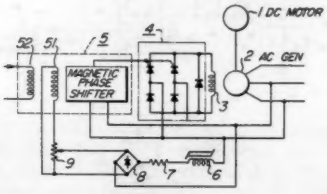
switches positive and negative, the pulses are coupled through a pulse transformer to the non-isolated portion of the circuit. This latter circuit includes a flip flop which is driven to follow the multivibrator to produce the same duty-cycle signal in the output circuit as was generated in the circuit electrically connected to the load.

The output circuit includes a second operational amplifier which scales and averages this duty-cycle signal and recreates a direct current signal proportional to the incoming voltage. The circuit thus results in a conversion from a voltage to a duty cycle and back to a voltage with very low drift.

3,714,541
VOLTAGE CONTROL APPARATUS FOR AC GENERATORS

Takeo Kuwabara; Hisakatsu Kiwaki; Hiroshi Sato, and Yoshimitsu Onoda, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed April 19, 1971, Ser. No. 135,229
Claims priority, application Japan, April 22, 1970, 45/33868
Int. Cl. H02p 9/30
U.S. Cl. 322—24 11 Claims

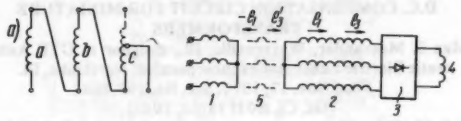


A saturable reactor is excited by the output of an AC generator, the field of which is controlled by a current exciting the reactor. Since the exciting current of the saturable reactor is proportional to an input voltage, the ratio of the output voltage to the output frequency of the AC generator is maintained constant.

3,714,542
EXCITATION SYSTEM FOR A SYNCHRONOUS MACHINE

Vladimir Semenovich Arutjunian, ulitsa Marxa, 8, kv. 18, and Sergei Grigorievich Amamchian, ulitsa Tamantsineri, 8, kv. 47, both of Erevan, U.S.S.R.

Filed Jan. 7, 1972, Ser. No. 216,131
Int. Cl. H02p 9/14
U.S. Cl. 322—59 4 Claims



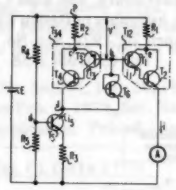
The present invention relates to an excitation system for a synchronous machine.

The system according to the invention is characterized in that at least one phase of an additional winding has at least one of the coils with a reduced number of turns as compared with the number of turns in the remaining coils of that phase, and the number of turns in that coils can be reduced to zero.

3,714,543
CONSTANT CURRENT CIRCUIT CONSTITUTED ON A MONOLITHIC IC

Masayoshi Sahara, and Yasuhiro Nanba, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 22, 1971, Ser. No. 200,691
Claims priority, application Japan, Nov. 21, 1970, 45/116287
Int. Cl. G05f 1/06; H02j 1/04
U.S. Cl. 323—4 15 Claims

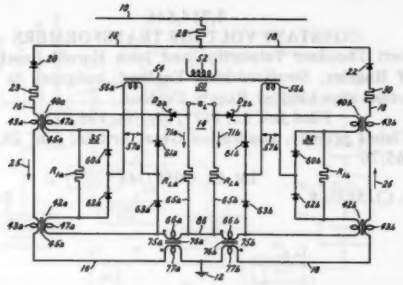


A constant current transistor circuit employs a pair of PNP transistors disposed adjacent to each other on a single monolithic integrated circuit. Also included are a pair of NPN transistors disposed adjacent to each other on the same monolithic integrated circuit, with respective ones of the PNP transistors and the NPN transistors being connected to each other to form first and second combined transistor circuits. In each of the combined transistor circuits, the emitter of the PNP transistor is connected to the collector of the NPN transistor, while the collector of the PNP transistor is connected to the base of the NPN transistor, the respective bases of each PNP transistor also being connected directly to each other. Also provided is a third NPN transistor to provide constant current, the collector of which is connected to the emitter of the NPN transistor of one of the combined transistor circuits, while a diode is connected between the connected bases of the PNP transistors of the two combined transistor circuits and the collector of the third NPN transistor, while a DC power source is connected in series with a load and is provided across the third NPN transistor and said combined transistor circuits.

3,714,544
BI-POLARITY POTENTIAL TRANSFORMER FOR MEASURING D-C VOLTAGE

Fred W. Kelly, Jr., Media, Pa.; Victor Mishkovsky, Ashland, N.J., and William R. Singletary, Wallingford, Pa., assignors to General Electric Company

Filed Jan. 6, 1972, Ser. No. 215,860
Int. Cl. G01r 19/00
U.S. Cl. 323—6 8 Claims

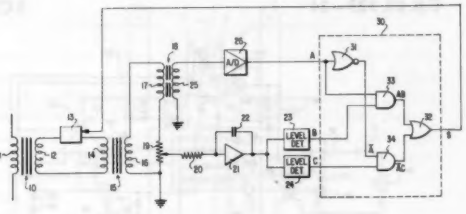


A bipolarity potential transformer for measuring the voltage between a d-c line and a reference point has unidirectionally conducting branches connected in inverse parallel relation between the d-c line and the reference point. Transductor-type d-c current transformers are respectively connected in the two branches for measuring current therethrough. The load circuits of the two transformers are connected together in such a manner that an output signal is obtained in which the component resulting from magnetizing current is at least practically cancelled. Balancing reactors having their secondary windings respectively connected in the load circuits of the current transformers and their primary windings respectively connected in the conductive branches inhibit the formation of certain notches in the wave form of the load circuit current which are attributable to magnetizing current.

3,714,545
CURRENT TRANSFORMER CONNECTION CONTROL

Alain Chiffert, Jouy-en-Josas, France, assignor to Comteurs Schlumberger, Montrouge, France

Filed April 18, 1972, Ser. No. 245,233
Claims priority, application France, April 30, 1971, 7115561
Int. Cl. G01r 31/06; G05f 1/22
U.S. Cl. 323—6 5 Claims



An apparatus for detecting specific conditions in a current transformer during the establishment of a short circuit current and anticipating saturation to prevent the connection of the transformer output to a utilization device. The apparatus include a voltage divider connected to the secondary winding and an integrater connected to integrate a portion of the voltage developed across the divider. The result of the integration is monitored as to direction and magnitude and an output

signal is generated which is indicative of both direction and whether or not the magnitude has exceeded a predetermined threshold. This value is used as being representative of the generation of flux in the magnetic circuit. Simultaneously, the sign of the derivative of the current is determined. The signals thus generated are coupled to a circuit which performs the logical decision $S = A \cdot B + A \cdot C$. A signal resulting from this decision inhibits connection of the transformer to the utilization device.

3,714,546

CONSTANT VOLTAGE TRANSFORMERS

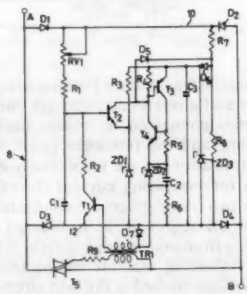
Robert Theodore Tolworthy, and John Harold Leach, both of Rugeley, Straffordshire, England, assignors to Thorn Automation Limited, Rugely, England

Filed Jan. 22, 1971, Ser. No. 108,713

Claims priority, application Great Britain, Jan. 28, 1970, 4,165/70

Int. Cl. G05f 1/44

U.S. Cl. 323—8 **5 Claims**



A constant voltage regulators in which the output current is limited by a series impedance and the output voltage is shorted for the remainder of each half cycle by the operation of a solid state switching device whose operation is initiated when the time integral of the output voltage taken with zero initial conditions at the start of each half cycle reaches a predetermined magnitude.

3,714,547

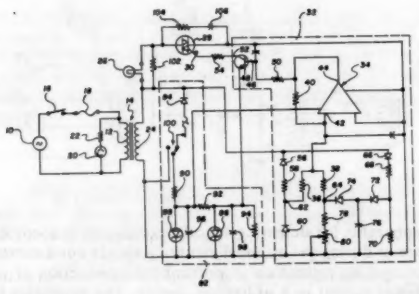
VOLTAGE REGULATION CIRCUIT

Theron A. Ross, Jr., Rochester, and Jon W. Youngman, Macedon, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 16, 1971, Ser. No. 163,159

Int. Cl. G05f 1/32

U.S. Cl. 323—24 **5 Claims**



A voltage regulation circuit for maintaining the RMS voltage supplied to a load substantially constant compared to the RMS line voltage. A triac connected in series with an AC load is gated to conduction for more than 180° but less than 360° of each cycle by means of a trigger circuit including an operational amplifier which sums the voltage developed across a capacitor during the first half cycle of the AC input voltage with a reference voltage to produce a varying output voltage which controls the length of time that the triac conducts during the second half cycle and during the next succeeding first half cycle of the input signal.

3,714,548

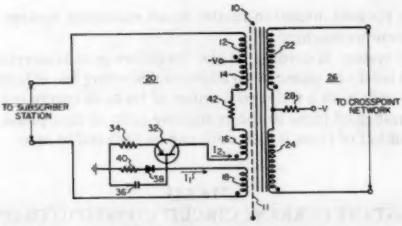
D.C. COMPENSATION CIRCUIT FOR MINIATURE TRANSFORMERS

Max S. Macrander, Warrenville, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 17, 1971, Ser. No. 199,464

Int. Cl. H01f 13/00, 19/02

U.S. Cl. 323—48 **7 Claims**



A d.c. compensation circuit for insertion in a miniature transformer to substantially compensate any d.c. magnetization and permit elimination of the requirement for an air gap. A.c. currents are, however, passed without significant attenuation.

3,714,549

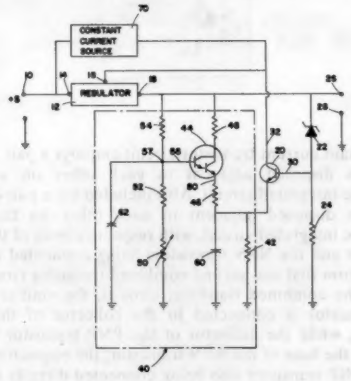
TEMPERATURE COMPENSATION CIRCUIT FOR A REGULATED POWER SUPPLY

Edwin E. Mason, Harrisburg, and Ross C. Libby, West Jefferson, both of Ohio, assignors to Design Elements, Inc.

Filed April 20, 1972, Ser. No. 245,768

Int. Cl. G05f 1/58

U.S. Cl. 323—22 T **7 Claims**



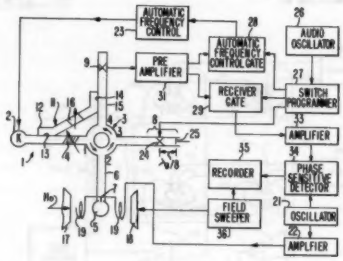
A temperature compensation circuit for stabilizing the output voltage of a regulated power supply. The regulator includes an output-shunting zener diode and a feedback transistor for controlling the regulator. The compensation circuit has a Darlington pair connected to the feedback transistor to form a differential amplifier. An adjustable voltage divider, connected across the regulated output, maintains a constant voltage on the input of the Darlington pair.

3,714,550

MICROWAVE SPECTROMETER APPARATUS

James S. Hyde, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Nov. 2, 1970, Ser. No. 85,851
Int. Cl. G01n 27/78
U.S. Cl. 324—.5 R 19 Claims



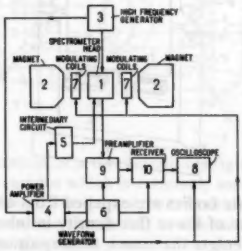
A microwave spectrometer is disclosed which employs a microwave reflection cavity bridge. The bridge includes a 4 port circulator having a source of microwave power applied to its first port, a matched sample cavity resonator coupled to the second port, a phase modulator coupled to the third port for phase modulating the microwave reflected cavity signal, and a microwave detector coupled to the fourth port. A reference channel interconnects the microwave source and the microwave detector for providing a reference phase. The phase of the reflected cavity signal is modulated by 90° and/or 180° and the detected output is synchronously detected against the phase modulation to obtain improved spectrometer response.

3,714,551

METHOD FOR MEASURING THE DISTRIBUTION OF MAGNETIC NUCLEAR RELAXATION TIMES

Zdzislaw Pajak, Poznan; Kazimiera Jurga, Koscian, and Jan Jurga, Poznan, all of Poland, assignors to Uniwersytet im. Adama Mickiewicza u Pozaniu, Poznan ul. Stalingradzka, Poland

Continuation of Ser. No. 56,391, July 20, 1970, abandoned.
This application Feb. 5, 1971, Ser. No. 113,027
Claims priority, application Poland, July 18, 1969, P 134.921
Int. Cl. G01n 27/78
U.S. Cl. 324—.5 R 3 Claims



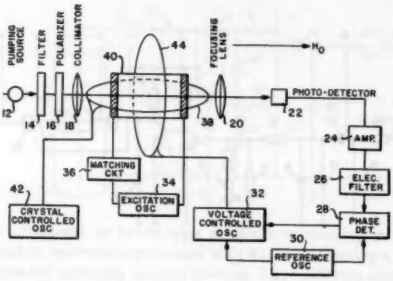
A method of measuring distribution of nuclear magnetic spin-lattice relaxation times in the spectrum of nuclear magnetic resonance using a standard high resolution spectrometer in which two successive transitions are made through resonance at modulation of a constant magnetic field at strong and weak levels. A time interval between the transitions is chosen to equal the product of the relaxation time and the natural logarithm of two.

3,714,552

METHOD OF REDUCING ERRORS ARISING FROM THE RADIO FREQUENCY OSCILLATOR SYSTEM OF OPTICALLY PUMPED MAGNETOMETERS

Louis R. Hirschel, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 19, 1972, Ser. No. 218,970
Int. Cl. G01r 33/08
U.S. Cl. 324—0.5 R 4 Claims



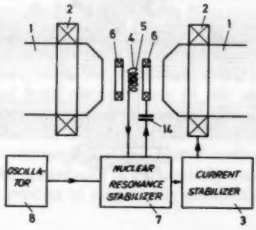
An optically pumped magnetometer utilizing the phenomenom of multiple photon transitions in helium. Multiple transition makes possible the use of two oscillators of any frequency in an He magnetometer, whose total quantum energy and angular momentum are equivalent to the values required by single-field irradiation. A field at frequency f_1 is generated by means of a crystal-controlled oscillator and a field at frequency f_2 is generated by a voltage-controlled oscillator such that $f_1 >> f_2$, whereby a circularly-polarized field may be generated by the crystal-controlled oscillator, which virtually eliminates the Bloch-Siegert effect and results in a very stable system. To conserve angular momentum in such a system, the two oscillators have their coils mounted perpendicular to one another.

3,714,553

FINELY STABILIZING THE MAGNETIC FIELD OF A MAGNETIC NUCLEAR RESONANCE DEVICE

Toni Keller, Fallanden, Switzerland, assignor to Spectrospin AG, Fallanden, Switzerland

Filed March 10, 1971, Ser. No. 122,960
Claims priority, application Switzerland, March 12, 1970, 3698/70
Int. Cl. G01n 27/78
U.S. Cl. 324—0.5 R 15 Claims



In a magnetic nuclear resonance spectrum analyzer including a pair of pole pieces for producing a magnetic field and coils disposed around the pole pieces and supplied with current from a device which effects a coarse stabilization of the magnetic field between the pole pieces, a pair of broadband coils having no iron in their cores disposed in the air gap between the pole pieces iron in their cores disposed in the air gap between the pole pieces and connected to receive a high frequency component of the output of a nuclear resonance stabilizer for effecting a fine stabilization of the magnetic field.

3,714,554

ARRANGEMENT FOR DETERMINING THE TIMING OF IGNITION OF A CYLINDER OF AN INTERNAL COMBUSTION ENGINE

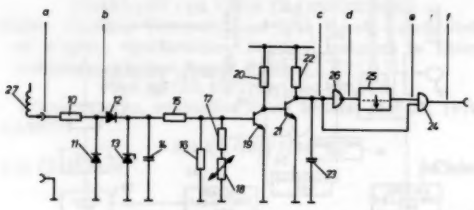
Walter Benedix, Reichenbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 9, 1971, Ser. No. 170,002

Claims priority, application Germany, Aug. 29, 1970, P 20 42 980.5

Int. Cl. G01m 15/00; F02p 17/00

U.S. Cl. 324—16 R 14 Claims



A signal is derived from the primary of the ignition coil. The signal is amplitude limited, has negative portions removed, and is smoothed and extended in time by a determined time interval. The trailing edge of the so-extended signal is steep since it results from cut off from a transistor. The leading edge of the pulse is used to trigger a multivibrator having a negative output signal. The multivibrator signal and the extended signal are applied to an AND gate where the output comprises the extended signal after subtraction of the negative pulse from the multivibrator. The resulting signal has a determined phase angle to the start of the spark and a rectangular shape with sharp leading and trailing edge.

3,714,555

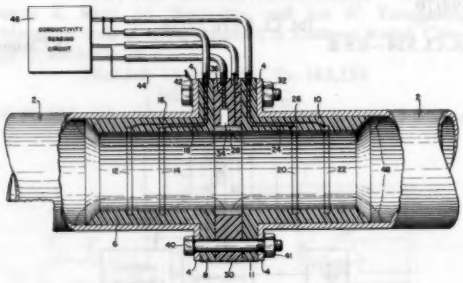
CONDUCTIVITY SENSOR

Homer L. Greer, Bryn Athyn, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 25, 1971, Ser. No. 146,745

Int. Cl. G01 n 27/42

U.S. Cl. 324—30 B 3 Claims



A conductivity cell has a pair of similar conductivity measuring sub-assemblies extending in opposite directions from an annular energizing electrode. Each sub-assembly includes a pair of spaced-apart sensing electrodes mounted within a hollow cylindrical electrically-insulating member having electrical connecting wires embedded in the walls thereof. The two pairs of annular sensing electrodes are connected in parallel to a conductivity measuring apparatus while an energizing signal is applied between the annular energizing electrodes and a wall of a flow line encompassing the conductivity cell.

3,714,556

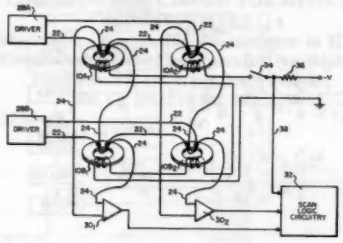
ELECTRO-MAGNETIC CURRENT-SENSING SCANPOINT MATRIX HAVING MEANS FOR DETECTING AND ISOLATING ELECTRICAL FAILURES WITHIN THE MATRIX

Frank A. Risky, Cicero, Ill., assignor to GTE Automatic Electric Laboratories Inc., Northlake, Ill.

Filed Dec. 8, 1971, Ser. No. 205,806

Int. Cl. G01r 33/00

U.S. Cl. 324—34 R 6 Claims



The linear ferrite cores of an electromagnetic scan point matrix are provided with a test winding wired in opposition to the control windings which are coupled to the monitored contacts. Selective application of a test voltage to the test windings reverses the logical output signals from the matrix and the failure of a given scanpoint output to reverse is indicative of an electrical failure in that scanpoint.

3,714,557

MAGNETIC GAS ANALYZER UTILIZING INDUCTIVE MEANS TO SENSE DISPLACEMENTS AND TO REBALANCE THE ANALYZER

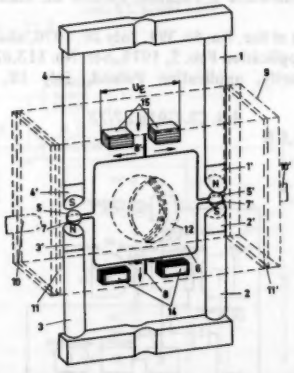
Theodor Gast, Bergstrasse 1, 1 Berlin 39, Germany

Filed Oct. 13, 1970, Ser. No. 80,304

Claims priority, application Germany, Oct. 13, 1969, P 19 51 532.3

Int. Cl. G01r 33/12

U.S. Cl. 324—36 22 Claims



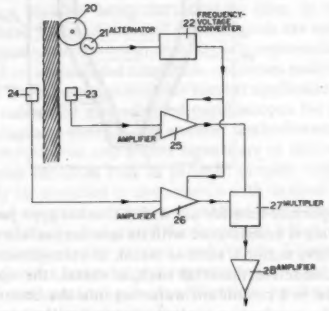
Non-magnetic bodies are expelled from a zone of high flux density to zone of lower flux density in inhomogenous fields when oxygen enters the zones, the expulsion being against a very slightly biasing positioning means. A wire loop frame moves with the bodies to alter the inductive coupling between high frequency sending and receiving coils so that voltage induced in the latter varies with oxygen and concentration. The induced voltage is rectified and sent back to the loop which contains smaller loops situated in the fields so that the rectified feedback tends to urge the bodies back into the field. The regressive feedback is a measure of oxygen concentration.

3,714,558

MAGNETIC SENSOR FOR DETECTING BREAKS IN A STEEL ROPE INCLUDING MULTIPLIER FOR ELIMINATING NOISE

Lourens Petrus Swanepoel, Johannesburg, South Africa, assignor to Anglo American Corporation of South Africa Limited

Filed Sept. 2, 1970, Ser. No. 68,863
Int. Cl. G01r 33/12
U.S. Cl. 324—37 4 Claims



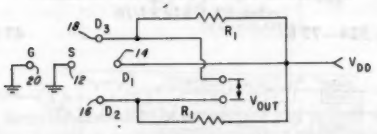
Apparatus for detecting wires in a steel wire winding rope in which the rope is passed through a magnetic field and sensing coils are employed to detect any magnetic dipoles created between the ends of broken wires in the rope. In order to minimize the effect of noise on the ultimate recordings the outputs of the sensing coils are multiplied in an analogue multiplier.

3,714,559

METHOD OF MEASURING MAGNETIC FIELDS UTILIZING A THREE DRAM IGFET WITH PARTICULAR BIAS

Robert Thomas Bate, Richardson, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed Aug. 10, 1971, Ser. No. 170,568
Int. Cl. G01r 33/02
U.S. Cl. 324—43 R 4 Claims



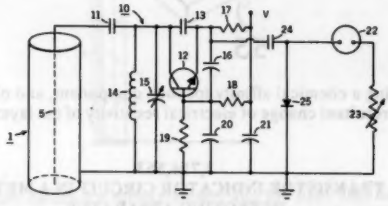
A mode of operation of a three-drain configured insulated gate field effect transistor which is extremely sensitive to magnetic fields is disclosed. The gate of the transistor is biased to a level less than transistor threshold, or alternatively, is connected to substrate ground. A first drain region opposite the source is biased to achieve avalanche breakdown of the junction. The other two drains are defined on either side of a line joining the source and first drain. These two drains are biased at a voltage below that required for avalanche of their junctions. In response to a magnetic field a voltage difference is generated across these two drains. In one embodiment of the invention, the region opposite the source is of a conductivity type the same as the substrate. In this configuration the detector does not require avalanche breakdown.

3,714,560

ELECTRICAL APPARATUS FOR MEASUREMENT OF MOISTURE CONTENT BY MEASUREMENT OF RADIO FREQUENCY POWER ABSORPTION UTILIZING A POWER LIMITING CAPACITOR

Marvin Paul Farr, San Pedro, Calif., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Nov. 17, 1970, Ser. No. 90,277
Int. Cl. G01r 27/26
U.S. Cl. 324—61 7 Claims



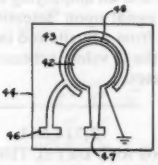
A continuous or batch type moisture measuring device of particulate material is provided with a test cell having a radiating element centrally located therein. The radiating element is electrically connected to a solid state radio frequency oscillator circuit and as radio frequency power absorption is effected by the moisture content of the material in the test cell, this effect of the radio frequency power absorption is reflected on an indicator.

3,714,561

TRANSDUCER FOR MEASURING THE DISPLACEMENT OF AN ELECTRICALLY CONDUCTIVE OBJECTIVE

Paul T. Jaquay, Kettering, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 24, 1970, Ser. No. 92,467
Int. Cl. G01r 27/26
U.S. Cl. 324—61 P 3 Claims



A motion detection transducer comprises a sensing element and an excitation-shield element, both elements being formed of a conductive metal. The sensing element, whose front surface is usually flat, is partially or completely surrounded by and spaced apart from the excitation-shield element. The front surfaces of both elements are in the same geometric plane. The sensing element is connected directly to a charge amplifier by means of a coaxial cable while the excitation-shield element is connected to a source of constant, direct current voltage. The transducer is particularly useful in measuring the relative motion of electrically conductive surfaces or objects.

3,714,562

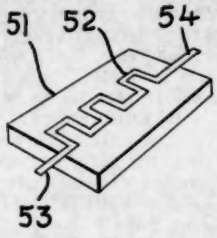
METHOD AND APPARATUS FOR THE DETECTION OF SELECTED COMPONENTS IN FLUIDS

John J. McNerney, Tempe, Ariz., assignor to Selco Mining Corporation Limited, Toronto, Ontario, Canada

Filed April 23, 1971, Ser. No. 137,684
Int. Cl. G01n 27/04; H01c 13/00
U.S. Cl. 324—65 R 16 Claims

A component of a fluid mixture, for example mercury vapor

in air, is detected by selectively adsorbing the component onto a conductive thin layer of molecular thickness of a material



having a chemical affinity for such component, and observing the resultant change of electrical resistivity of the layer.

3,714,563

TRANSISTOR INDICATOR CIRCUIT IN A METAL DETECTING APPARATUS

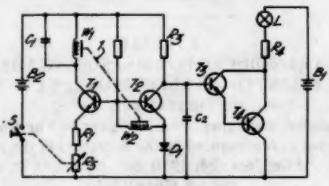
Christl Voll, Nikolaus-Feystrasse 2, Hassfurt, Germany

Filed May 28, 1971, Ser. No. 148,043

Claims priority, application Germany, June 4, 1970, P 20 27 408.2

Int. Cl. G01v 3/08

U.S. Cl. 324—67 2 Claims



A metal detecting apparatus including an oscillator circuit, a switching circuit and an amplifying circuit, arranged to give a visual or other signal upon detection of a metal within a threshold distance from a ferrite rod in the apparatus. When a metal is detected, the Q value increases and the oscillator circuit current decreases.

3,714,564

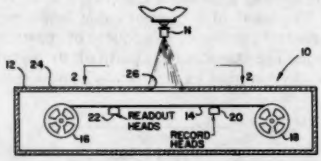
DROPLET SIZING AND DETECTING APPARATUS AND METHOD USING A MAGNETIC RECORDING

Richard E. Reinnagel, Elma, N.Y., assignor to Cornell Aeronautical Laboratory Inc., Buffalo, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,749

Int. Cl. G01n 27/00

U.S. Cl. 324—71 CP 11 Claims



An aerosol droplet detecting and sizing apparatus and method which comprises exposure to an aerosol of a portion of magnetic recording tape, the binder of which is soluble in the droplet material and noting the change in a prerecorded signal on the tape in response to the attack thereof by the droplet.

3,714,565

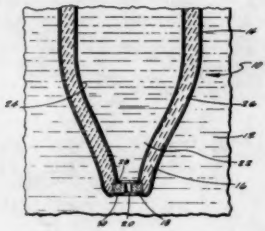
ELECTRONIC PARTICLE ANALYZING APPARATUS WITH IMPROVED APERTURE TUBE

Wallace H. Coulter, Miami Springs, and Walter R. Hogg, Miami Lakes, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed March 26, 1971, Ser. No. 128,332

Int. Cl. G01n 27/00

U.S. Cl. 324—71 CP 13 Claims



An aperture tube for use with a Coulter type particle analyzing device is constructed with its interior surface covered with conductive material such as metal, its exterior surface covered with conductive material such as metal, the aperture being provided in a corundum wafer set into the bottom end of the tube. The conductive coating approaches the aperture as close as several aperture diameters, surrounding the aperture so that except for the path of the aperture itself, flow of aperture current through the electrolyte is minimized, thereby decreasing heating of the electrolyte with its attendant noise. The invention is primarily applicable to situations where the aperture current is a high frequency current to avoid polarization.

The aperture tube is useful in the configuration where it is the transducer for a Coulter particle analyzing apparatus or it may be used as part of a system in which size as ascertained by use of the Coulter method is utilized in connection with a droplet forming and separating device to classify particles by size.

3,714,566

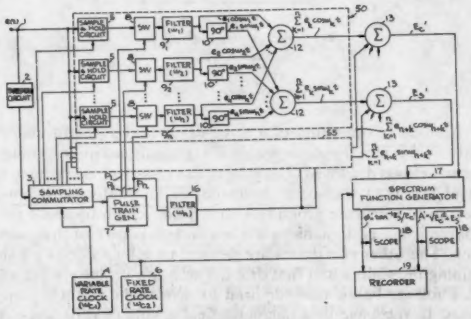
APPARATUS AND METHODS FOR DERIVING IN ESSENTIALLY REAL TIME CONTINUOUS ELECTRICAL REPRESENTATIONS OF THE FOURIER AND INVERSE FOURIER TRANSFORM

George S. Kang, Silver Spring, Md., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 799,067, Feb. 13, 1969. This application Sept. 2, 1970, Ser. No. 68,861

Int. Cl. G01r 23/16

U.S. Cl. 324—77 E 47 Claims



Apparatus and methods for deriving in essentially real time unweighted and weighted continuous electrical representations of the Fourier transform and/or the inverse Fourier transform of a complex waveform. In performing the Fourier

transform, the input waveform is sampled at the Nyquist sampling rate and the samples stored in respective sample-and-hold circuits. These samples are applied to signal generating circuitry for deriving harmonically related time-varying cosine and sine signals having peak values corresponding to weighted or unweighted values of respective ones of the sample-and-hold circuit outputs, and having a fundamental frequency which may be chosen independently of the frequency content of the input waveform. These cosine and sine signals are then respectively summed for producing resultant summed sine and cosine signals which respectively correspond to weighted or unweighted representations of the real and imaginary components of the Fourier transform of the input waveform with the frequency variable being simulated by time. In one embodiment, these summed sine and cosine signals are applied to a function generator for generating signals representative of the weighted or unweighted amplitude spectrum and/or phase spectrum of the input waveform for further application to appropriately calibrated and adjusted oscilloscopes for producing visual displays thereof. In another embodiment, these resultant summed sine and cosine signals are in turn sampled at the Nyquist sampling rate to provide samples which may conveniently be modified in accordance with desired criteria. The modified samples are then recombined using the inverse Fourier transform technique of the invention which employs circuitry basically similar to that used for the Fourier transform to produce an output signal representative of the original input signal and containing the modifications produced in accordance with the desired criteria.

3,714,567

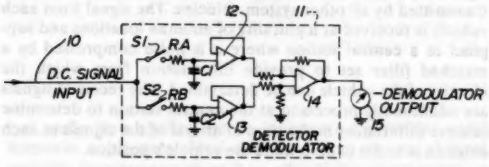
DETECTOR-DEMODULATOR FOR MODULATED (REVERSED) AC AND DC SIGNALS

Norbert L. Kusters, and Malcolm P. MacMartin, both of Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed May 12, 1971, Ser. No. 142,544

Int. Cl. G01r *19/00*

U.S. Cl. 324—111 **8 Claims**



A detector-demodulator for current and voltage measuring devices having a modulated (reversing) output wherein the detector-demodulator incorporates time constant elements after the demodulation stage that permit the use of a fast acting detector and yet achieves a narrow bandwidth performance. The apparatus comprises first and second switches connected in parallel to the output of the measuring device, voltage storage means incorporating long time constant elements connected to each of the outputs of said switches, switch operating means for opening and closing said switches in a predetermined timing sequence, and means attached to the output of the voltage storage means for measuring the difference in the voltage levels stored in the voltage storage means. The timing sequence may be controlled manually or automatically and would be arranged such that the modulated output would be sampled only during a relatively steady-state period so that switching transients would not appear in the output.

3,714,568

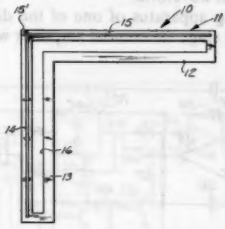
VARIABLE METER SHUNT

Willis A. Ridings, Jr., P. O. Box 236, Fort Supply, Okla.

Filed Sept. 21, 1971, Ser. No. 182,363

Int. Cl. G01r *1/00*; **H01c** *5/00*

U.S. Cl. 324—126 **4 Claims**



A shunt device for milliammeters and the like. This device consists primarily of a slotted plastic member having a low resistance wire in one leg and a high resistance wire in the other leg, the wires being joined at the apex of the 90° angle formed by the legs of the device.

3,714,569

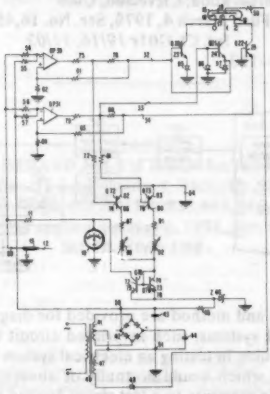
ELECTRONIC MEASURING INSTRUMENT WITH DIGITAL DISPLAY SCALE EXTENSION

Harry F. Bruning, Jr., Cornwall, and William L. Blowers, Newburgh, both of N.Y., assignors to Kollmorgen Corporation, Holyoke, Mass.

Filed May 28, 1970, Ser. No. 41,219

Int. Cl. G01r *1/02, 15/08, 17/06*

U.S. Cl. 324—131 **8 Claims**



An electronic measuring system and instrument circuit is described having analog and digital components. The digital display is automatically actuated upon inputs exceeding predetermined ranges beyond the capability of the analog device and is combined with the reading of the analog indication.

3,714,570

APPARATUS FOR MEASURING THE EFFECTIVE VALUE OF ELECTRICAL WAVEFORMS

Jack D. Howell, 9815 Memphis Avenue, Brooklyn, Ohio

Filed April 9, 1970, Ser. No. 26,948

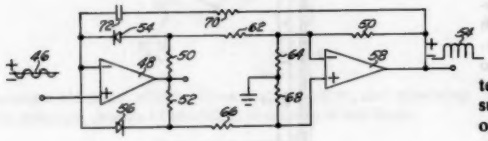
Int. Cl. G01r *15/10*; **G06g** *7/20*

U.S. Cl. 324—132 **9 Claims**

Devices for measuring the effective value of an input waveform are disclosed which employ one or more amplifiers

and a feedback path for supplying a feedback signal to the input of the detector which has a value such that the average output value of the waveform from the measuring circuit is substantially equal to the effective value of the input waveform. The output waveform is coupled to a conventional average measuring device, such as a meter, to obtain a measurement of the RMS (root-mean-square) or the effective value of the input waveform.

The measuring apparatus of one of the disclosed embodiments is a single stage differential amplifier which has its non-



inverting input terminal coupled to its output terminal through a resistor and a capacitor in series. Two other disclosed embodiments include two-stage circuits each of which has a pair of operational amplifiers which are coupled so that the second amplifier stage supplies an output signal of one polarity through an RC feedback path to the inverting input terminal of the first stage of amplification. A series combination of a resistor and a capacitor which is coupled between the resistor of the feedback path and the inverting input of the output amplifier stage is disclosed in one of the two-stage embodiments.

3,714,571

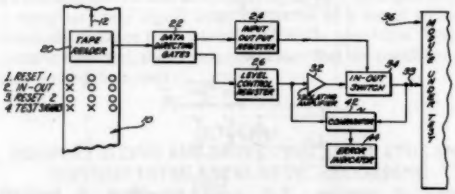
APPARATUS AND METHOD FOR TESTING ELECTRICAL SYSTEMS HAVING PULSE SIGNAL RESPONSES

Jerome F. Walker, Shaker Heights, Ohio, assignor to Digital General Corporation, Cleveland, Ohio

Filed March 4, 1970, Ser. No. 16,459

Int. Cl. G01r *19/16, 31/02*

U.S. Cl. 324—133 **2 Claims**



Apparatus and method are provided for diagnostically testing electrical systems, such as printed circuit boards and integrated circuits. In testing an electrical system having an output terminal which would normally or abnormally provide a pulse signal in response to a test signal applied to an input terminal thereof, a test signal is applied to the input terminal and a signal comparison is made to verify whether any response occuring at the output terminal corresponds with a signal representative of the anticipated pulse signal response.

3,714,572

ALIGNMENT AND TEST FIXTURE APPARATUS

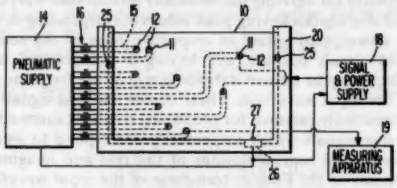
Jack Wesley Ham, Indianapolis, Ind., and John Milton Poplin, Indianapolis, Ind., assignors to RCA Corporation

Filed Aug. 21, 1970, Ser. No. 66,006

Int. Cl. G01r *31/02, 15/12*

U.S. Cl. 324—158 F **5 Claims**

There is disclosed a fixture for automatically testing circuit boards. The fixture utilizes a plurality of pneumatic cylinders, each of which is selectively activated by a suitable air valve under the control of a sequencing mechanism. The fixture



tests a circuit board inserted therein without introducing any substantial capacitance and inductance thereto because of the operation and selection of the pneumatic cylinders.

3,714,573

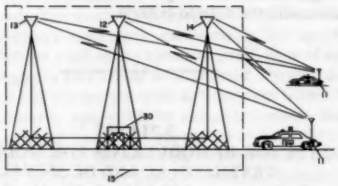
SPREAD-SPECTRUM POSITION MONITORING SYSTEM

Burton C. Grossman, Huntington, N.Y., assignor to Hazeltine Corporation

Filed May 6, 1970, Ser. No. 34,962

Int. Cl. H04k *1/00;* **H04b** *1/02;* **G01s** *3/02*

U.S. Cl. 325—32 **17 Claims**



POSITION MONITORING SYSTEM 10

Disclosed are systems capable of monitoring the positions of vehicles even under the multipath transmission conditions as may exist in a city. In one such system each vehicle contains apparatus which, without being interrogated, repetitively transmits a uniquely coded spread-spectrum identification signal asynchronous to the repetitive identification signals transmitted by all other system vehicles. The signal from each vehicle is received at a plurality of antenna locations and supplied to a central station where it is pulse compressed by a matched filter set to provide information from which the identity of the vehicle can be determined. The received signals are additionally processed at the central station to determine relative differences in the time of arrival of the signals at each antenna in order to determine the vehicle's position.

3,714,574

MOBILE COMMUNICATION SYSTEM

Takesi Baba, Tokyo; Koichi Osada; Takuya Hokawa, both of Yokohama, and Fumio Suzuki, Yokosuka-shi, all of Japan, assignors to Hitachi, Ltd. and Japanese National Railways, Tokyo, Japan

Filed April 25, 1969, Ser. No. 819,376

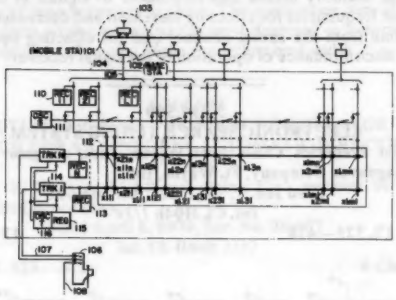
Claims priority, application Japan, April 30, 1968, 43/28582

Int. Cl. H04b *7/00*

U.S. Cl. 325—51 **10 Claims**

A mobile communication system in which many base stations are disposed along the path of a moving body and are successively switched over as the moving body moves along its path, and a plurality of zones ahead and after the zone through which the moving body is passing are blocked against the radio frequency used by the moving body so as to ensure a minimum talking time. In the system, when two moving bodies during oral communication at the same radio frequency ap-

proach each other, the radio frequency used by one of the moving bodies is altered to another frequency and the number



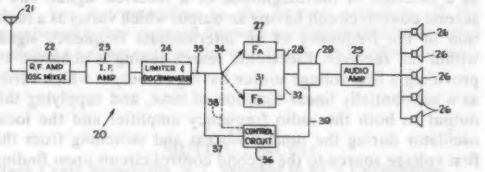
of blocked zones is varied depending on the advancing direction of the moving body so as to improve the utility of the radio frequency.

3,714,575

CODE CONTROLLED BROADCASTING SYSTEM

Theodore Rogalski, Buffalo, N.Y., assignor to Amalgamated Music Enterprises, Inc., Syracuse, N.Y.

Filed Aug. 7, 1970, Ser. No. 61,945
Int. Cl. H04h *1/04*
U.S. Cl. 325—53 **15 Claims**



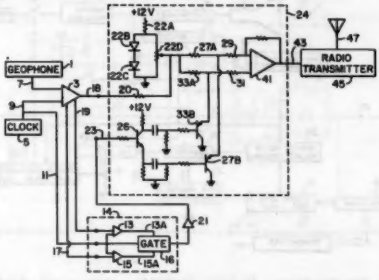
A radio broadcasting system includes a transmitter which transmits a program signal such as music on one channel, periodic message signals such as advertising commercials on another channel and a plurality of code signals of different frequencies occuring in time at the beginning of selected ones of the message signals. A plurality of radio receivers each receive the program, message and code signals and include means for audibly reproducing the program and message signals. Each receiver includes first and second filtering means responsive to only the program or message signals, respectively, together with switching means for connecting either of the first and second filtering means in the receiver circuit. Each receiver also includes a control circuit operative in response to the presence of a particular one of the code signals to cause movement of the switching means from one of the filters to the other. The control circuit includes feedback adjusting means in the frequency responsive input portion thereof, a high resistance coupling from input to output, and time delay means associated therewith which together assure that receiver operation is switched from program to message signal reproduction only in response to the particular intended code signal and not in response to other control signals closely spaced in frequency or to transient or spurious signals.

3,714,576

SEISMIC RADIO TELEMETRY SYSTEM

Robert A. Kirby, Houston, Tex., and Billy J. Propst, Houston, Tex., assignors to Esso Production Research Company

Continuation-in-part of Ser. No. 847,315, Aug. 4, 1969, abandoned. This application April 1, 1971, Ser. No. 130,147
Int. Cl. G08c *19/16*
U.S. Cl. 325—61 **2 Claims**



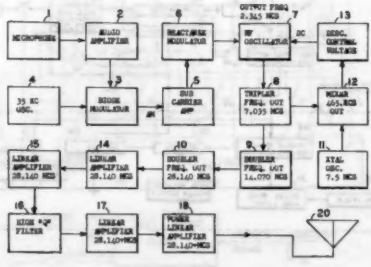
The output signal of a stepped gain amplifier is transmitted through a communications link (e.g., a radio link) by modulating a clock signal and varying a characteristic of the signal upon each gain change of the amplifier. The modulated clock signal is detected to produce an output signal indicative of the amplified output signal, and the variation in the characteristic is also detected to produce a signal indicative of gain changes. Preferably, a half cycle of the clock is eliminated upon each gain change to produce the gain change indication. A positive half cycle is eliminated for a gain variation in one sense and a negative half cycle is eliminated upon a gain change in the other sense.

3,714,577

SINGLE SIDEBAND AM-FM MODULATION SYSTEM

William A. Hayes, 12 Schiller Street, Hicksville, N.Y.

Continuation-in-part of Ser. No. 825,485, May 19, 1969, abandoned. This application May 6, 1971, Ser. No. 140,792
Int. Cl. H04b *1/66*
U.S. Cl. 325—145 **3 Claims**

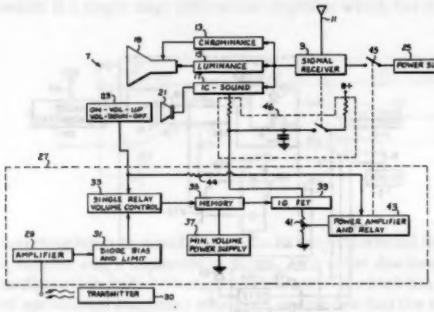


A sub-carrier signal is amplitude modulated. This sub-carrier AM modulated signal is then used to frequency modulate a radio frequency carrier. The radio frequency is then multiplied. One sideband in the modulated radio frequency signal is passed through a bandpass filter and then transmitted.

3,714,578
ELECTRONIC VOLUME AND ON/OFF CIRCUITS FOR REMOTE CONTROL SYSTEMS

Silverio Antonio Valdes, Alexander, N.Y., assignor to GTE Sylvania Incorporated

Filed June 3, 1971, Ser. No. 149,709
Int. Cl. H04b 1/16
U.S. Cl. 325—319 **10 Claims**

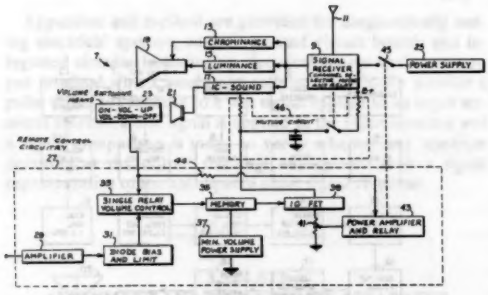


A remotely operable all electronic volume and on/off control circuit for a signal receiver having a sound channel responsive to variations in an alterable impedance includes an insulated-gate FET-type (IGFET) semiconductor and adjustable impedance series connected intermediate the sound channel and a potential reference level, an on-off relay coupled to the adjustable impedance for effecting energization of the signal receiver, a memory means coupled to the semiconductor, and a single relay up-down volume control means coupled to the memory means and responsive to signals at two different frequencies for effecting increased and decreased audio volume from the sound channel and for effecting operation and discontinuance of operation of the signal receiver.

3,714,579
ELECTRONIC VOLUME AND ON/OFF CIRCUITS FOR REMOTE CONTROL SYSTEMS

Silverio Antonio Valdes, Oakfield, and George Cleveland Waybright, Alexander, both of N.Y., assignors to GTE Sylvania Incorporated

Filed June 3, 1971, Ser. No. 149,710
Int. Cl. H04b 1/16
U.S. Cl. 325—319 **4 Claims**

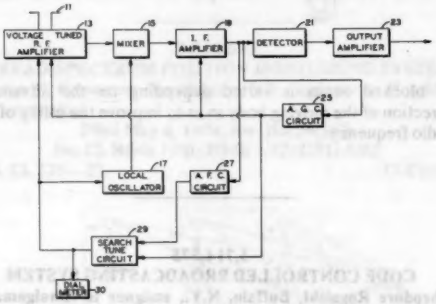


A remotely operable all electronic volume and on/off control circuit for a signal receiver having a sound channel responsive to variations in an alterable impedance includes an insulated-gate FET-type (IGFET) semiconductor and adjustable impedance series connected intermediate the sound channel and a potential reference level, an on-off relay coupled to the adjustable impedance for effecting energization of the signal receiver, a memory means coupled to the semiconductor, and a single relay up-down volume control means coupled to the memory means and responsive to signals at two different frequencies for effecting increased and decreased audio volume from the sound channel and for effecting operation and discontinuance of operation of the signal receiver.

3,714,580
ELECTRONIC SEARCH TUNING SYSTEM

Ernest Frederick Close, Fort Wayne, Ind., assignor to The Magnavox Company, Ft. Wayne, Ind.

Filed Jan. 7, 1971, Ser. No. 104,691
Int. Cl. H04b 1/34
U.S. Cl. 325—470 **13 Claims**

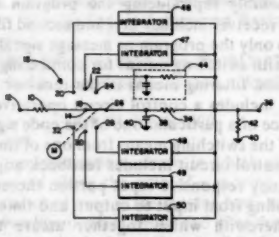


An electronic tuning system for a heterodyne type receiving device is disclosed wherein the receiving device consists of a voltage tuned radio frequency amplifier, a voltage tuned local oscillator, a first control circuit having an output which varies as a function of the magnitude of a received signal, and a second control circuit having an output which varies as a function of the frequency of an intermediate frequency signal within the receiver. Electronic search tuning is achieved by providing a first voltage source having an output which varies as a substantially linear function of time, and supplying this output to both the radio frequency amplifier and the local oscillator during the tuning process and switching from the first voltage source to the second control circuit upon finding a sufficiently strong incoming signal.

3,714,581
FIXED MEMORY INTEGRATOR

George E. Sage, Redmond, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 19, 1969, Ser. No. 859,402
Int. Cl. H04b 1/10
U.S. Cl. 325—473 **2 Claims**



An integrating circuit which overcomes the effects of spurious noise signals while detecting pulses of a known time dura-

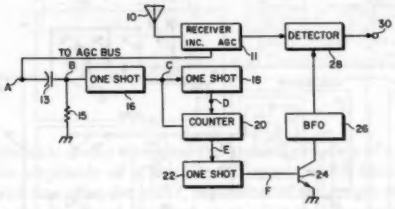
tion but occurring at an unknown time. The circuit samples the incoming signal in successive equal time segments, and applies the signal during each segment associated sample to a separate one of a plurality of integrating circuits equal to the number of time segments in pulse. The continuous sum of the signals from all the integrators is level detected to determine the occurrence of a pulse of the predetermined width.

3,714,582

AUTOMATIC BEAT FREQUENCY OSCILLATOR SWITCH FOR AN AIRBORNE AUTOMATIC DIRECTION FINDER

Stanley F. Kadron, Lighthouse Point, Fla., assignor to The Bendix Corporation

Filed April 8, 1970, Ser. No. 26,481
Int. Cl. H04b *1/32*
U.S. Cl. 325—341 **8 Claims**



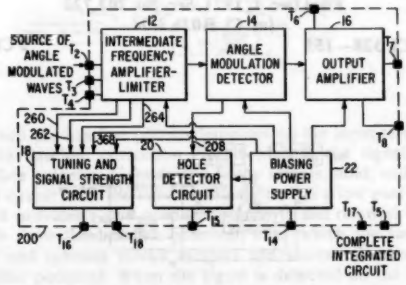
An automatic switching circuit for an airborne automatic direction finder energizes a beat frequency oscillator in the presence of beacon emissions in the form of interrupted CW signals at morse rates thereby rendering these beacon emissions upon receipt at the airborne automatic direction finder audible to the pilot. A counter counts pulses on the receiver AGC bus corresponding to the beacon emissions. If the number of pulses counted during a predetermined time period satisfies a known criteria, the beat frequency oscillator is energized.

3,714,583

MUTING CIRCUIT

Jack Craft, Somerville, N.J., assignor to RCA Corporation

Filed Aug. 26, 1970, Ser. No. 67,009
Int. Cl. H04b *1/10*
U.S. Cl. 325—348 **9 Claims**



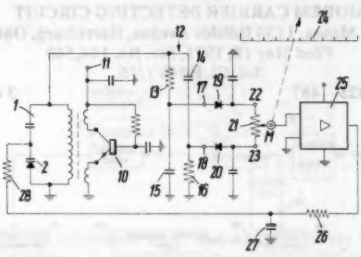
A muting circuit for FM receivers utilizing an envelope detector, DC coupled inverter amplifier, and hole rectifier circuit at the limiter output to generate a control voltage inversely proportional to the usable input signal wave, which is independent of receiver gain, for quieting a receiver below minimum usable signal wave levels.

3,714,584

CIRCUIT ARRANGEMENT WITH CAPACITY DIODE TUNING FOR DISPLAYING TUNING FREQUENCIES

Olaf Allner, 1 Berlin 36 Dresdner Str. 12, Berlin, Germany

Filed Feb. 16, 1971, Ser. No. 115,382
Claims priority, application Germany, Feb. 19, 1970, P 20 08 550.1
Int. Cl. H04b *1/06*
U.S. Cl. 325—455 **2 Claims**



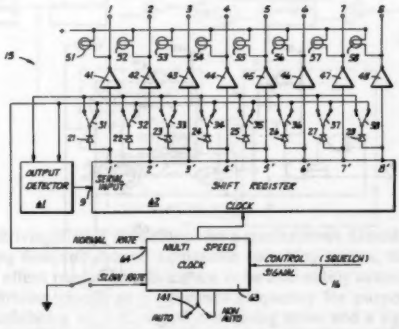
In a high frequency receiver circuit arrangement with capacity diode tuning for displaying tuning frequency, in particular for radio and television receivers, having capacity diode tuning the receiver oscillator circuit including a capacity diode is connected via a R-C-network and subsequent rectifying means oppositely directed to the terminals of a potentiometer resistor. Thereby this potentiometer is supplied with a dc voltage dependent on the frequency of the received oscillations. Its tap is connected electrically via a dc amplifier back to said capacity diode of the oscillator circuit. Besides the tap is connected mechanically to the pointer of the display on the tuning scale of the receiver, By adjusting the pointer on the tuning scale a precise tuning of the receiver by means of the capacity diode of the oscillator circuit is attained, since receiver tuning knob, pointer, and tap of the potentiometer is mechanically connected, for instance by means of a pulley drive system.

3,714,585

SCANNING RADIO HAVING RAPID CHANNEL SKIPPING CAPABILITY

Richard C. Koch, Englewood, Colo., assignor to Regency Electronics, Inc., Indianapolis, Ind.

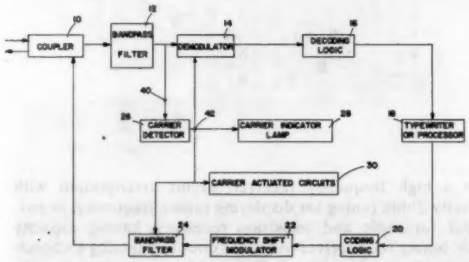
Filed Feb. 17, 1971, Ser. No. 116,201
Int. Cl. H04b *1/32*
U.S. Cl. 325—468 **15 Claims**



Multi-frequency receiver having a local oscillator with a plurality of channel determining elements sequentially connectable to control the received frequency. A shift register

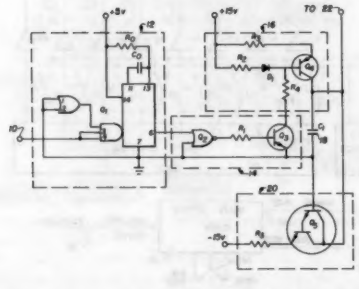
controlled by a multi-speed clock is used in sequencing through the channel elements. Switches are provided for each channel to control the speed of the clock. When a channel switch is set for a high speed and as the channel determining element associated with that switch is connected to the oscillator circuit, the clock pulses rapidly again thus sequencing the receiver to the next channel determining element before the carrier sensing circuitry can lock on the channel.

3,714,586
MODEM CARRIER DETECTING CIRCUIT
Edwin E. Mason, 1133 Hillside Avenue, Harrisburg, Ohio
Filed May 18, 1971, Ser. No. 144,540
Int. Cl. H04b *1/16*
U.S. Cl. 325—487 **3 Claims**



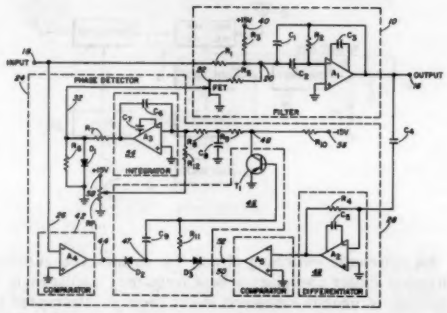
A modem circuit for distinguishing a frequency shift modulation carrier from noise of a comparable amplitude for use in immediately inhibiting the erroneous response of a data terminal to noise while permitting terminal operation soon after the presence of an acceptable carrier. Noise deadbands are detected and timed and, if 10 milliseconds in duration produce an inhibit output. The inhibit output is maintained for at least 150 milliseconds to permit return of the electromechanical terminal components to a quiescent condition.

3,714,587
LINEAR PULSE COUNTER APPARATUS
Carl B. Lindsey, China Lake, and Joe A. McKenzie, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy
Filed March 20, 1972, Ser. No. 236,286
Int. Cl. H03k *21/00*
U.S. Cl. 328—41 **3 Claims**



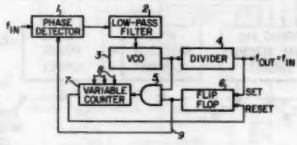
Incoming pulses are applied to a retriggerable, monostable multivibrator which produces an output pulse having a pulse width substantially equal to 1.5 times the nominal period of the pulse rate. The multivibrator is retriggered every time an incoming pulse is received and the output thereof switches a constant current source on or off to thereby charge and discharge in a linear fashion an integrating capacitor. Threshold detector means produce an output count when the charge on the capacitor equals or exceeds a predetermined value corresponding to the reception of at least three out of five pulses.

3,714,588
SELF-TUNING BANDPASS FILTER
Gordon J. Deboo, and Roger C. Hedlund, both of Sunnyvale, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Oct. 13, 1970, Ser. No. 80,368
Int. Cl. H03b *1/04*
U.S. Cl. 328—167 **5 Claims**



An electronic filter which simultaneously maintains a constant bandwidth and a constant center frequency gain as the input signal frequency varies, and remains self-tuning to that center frequency over a decade range. The filter utilizes a field effect transistor (FET) as a voltage variable resistance in the bandpass frequency determining circuit. The FET is responsive to a phase detector to achieve self-tuning.

3,714,589
DIGITALLY CONTROLLED PHASE SHIFTER
Roger G. Lewis, 43 Thorncliffe Pk., Dr., Toronto, Ontario, Canada
Filed Dec. 1, 1971, Ser. No. 203,722
Int. Cl. H03b *3/04*
U.S. Cl. 328—155 **2 Claims**

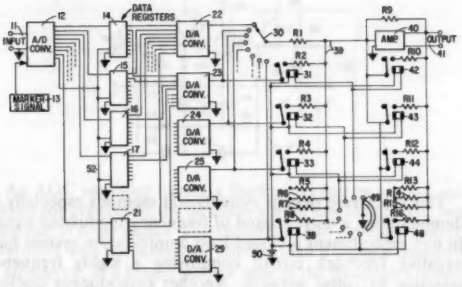


Disclosed is a digitally controlled phase shifter which utilizes a phase locked loop to provide a closed loop system for the determination of phase shift. The phase shift at the output is controlled in arbitrarily small increments by adjustment of the division ratio of a digitally controlled variable counter.

3,714,590
AVERAGING CIRCUIT

Francis R. Freeman, and Joseph D. Vitali, both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed Nov. 8, 1971, Ser. No. 196,296
Int. Cl. G06g 7/00; H03f 1/34
U.S. Cl. 328—158 3 Claims

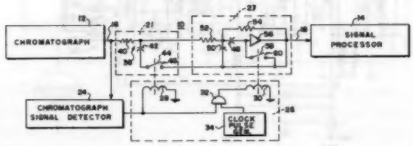


A circuit is shown which has the unusual property of averaging the amplitude of a plurality of signals which have been received one after the other, regardless of the length of time before the signal was received, or the fact that the signal amplitude during reception increasingly changed. The number of signals so averaged may be altered at will up to a predetermined maximum. If desired, the amplitude of each of the signals being averaged can be separately indicated.

3,714,591
BASELINE CORRECTION CIRCUIT

Robert W. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Feb. 17, 1972, Ser. No. 227,180
Int. Cl. H03k 5/08, 1/10
U.S. Cl. 328—162 19 Claims

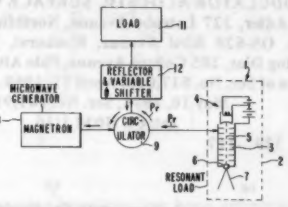


When the baseline potential appears on the input terminal of the baseline correction circuit without the signal, the baseline potential is conducted to the sample, hold, and subtract circuit from the input terminal through a low pass filter which provides a slow propagation rate to and removes some ripple from the baseline potential, after which the sample, hold and subtract circuit samples and stores values of the baseline potential. When the signal is detected on the input terminal by a signal detector, the low pass filter is disconnected so that the signal is received at a higher rate of propagation without being distorted by the low pass filter, with the sample, hold and subtract circuit subtracting the stored baseline potential from the signal. The change in the propagation rate is sufficient to compensate for any delay in the signal detector so that the last stored value of baseline potential is not increased by the beginning of the signal.

3,714,592
NETWORK FOR PULLING A MICROWAVE GENERATOR TO THE FREQUENCY OF ITS RESONANT LOAD

Howard R. Jory, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation-in-part of Ser. No. 110,431, Jan. 28, 1971, abandoned. This application Dec. 6, 1971, Ser. No. 204,805
Int. Cl. H01j 23/00, 23/34
U.S. Cl. 328—233 14 Claims

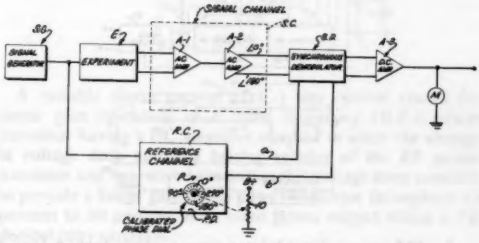


A resonant microwave load, such as a microwave linear accelerator section, is coupled to a magnetron oscillator via the intermediary of a circulator. Power reflected from the resonant load is reflected to the circulator and thence to a wave absorptive load. A composite wave reflector and variable phase shifter is provided between the absorptive load and the circulator for reflecting a portion of the power reflected from the resonant load to the magnetron oscillator for pulling the frequency of the oscillator to the frequency of the resonant load. The composite wave reflector and variable phase shifter includes a wave reflective member carried from a support rod passing through the wall of a rectangular waveguide. Rotation of the support rod causes the wave reflective member to move in a generally axial direction within the waveguide for adjusting the phase of the reflected wave such as to pull the frequency of the magnetron to the frequency of the resonant load.

3,714,593
SYNCHRONOUS DEMODULATOR HAVING AN IMPROVED DRIVING CIRCUIT

Robert Clarence Kime, Fairview Park, and Warren Frederick Miller, Euclid, both of Ohio, assignors to Keithley Instruments Inc., Solon, Ohio

Filed Nov. 24, 1971, Ser. No. 201,691
Int. Cl. H03d 3/02, 3/18
U.S. Cl. 329—50 14 Claims



A driving circuit is disclosed for a synchronous demodulator having first and second actuatable switching means, such as field effect transistors, which are to be alternately actuated by the driving circuit at a reference frequency for purposes of demodulating an A.C. signal containing noise and a signal of interest. The driving circuit serves to receive a reference signal at the reference frequency and to provide therefrom first and second drive signals displaced in phase by 180° for alternately actuating the first and second switching means. The phase relationship between the drive signals and the reference

signal is varied independently of variations in the reference frequency. This is accomplished with circuitry which serves to provide a ramp signal which varies from a first level toward a second level in synchronism with the reference frequency, and to provide an output pulse whenever the ramp signal attains a threshold level. The threshold level is adjustable to vary the phase relationship between the output signal pulse and the reference signal.

3,714,594

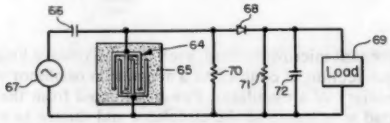
DEMODULATOR ACOUSTIC SURFACE WAVE DEVICE

Robert Adler, 327 Latrobe Avenue, Northfield; Adrian J. De Vries, OS-628 Kird Avenue, Elmhurst, both of Ill., and Fleming Dias, 285 College Avenue, Palo Alto, Calif.

Division of Ser. No. 817,093, April 17, 1969. This application May 10, 1971, Ser. No. 141,912

Int. Cl. H03d *3/16*

U.S. Cl. 329—117 **4 Claims**



A demodulator for use in a wave signal receiver that utilizes a program signal frequency modulated upon a predetermined carrier comprises an acoustic-surface-wave propagating medium. The program signal is applied directly across a transducer which is coupled to the medium and which, in response to the program signal, interacts with the acoustic-surface-waves on the medium. A unidirectional conductive device and a load are coupled in series across the transducer.

3,714,595

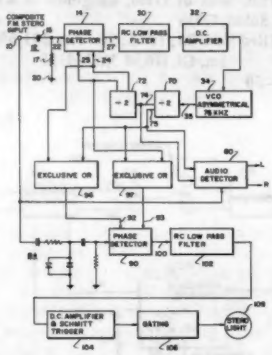
DEMODULATOR USING A PHASE LOCKED LOOP

Jeffrey N. Denenberg, Chicago, and William J. Padgett, Berwyn, both of Ill., assignors to Warwick Electronics Inc.

Filed March 25, 1971, Ser. No. 128,004

Int. Cl. H03d *3/24*

U.S. Cl. 329—122 **11 Claims**



An FM stereo demodulator uses a phase locked loop to synchronize a 76 kHz oscillator with a received 19 kHz pilot. A two stage binary frequency divider is coupled in cascade with the oscillator to provide a symmetrical 38 kHz waveform for carrier reinsertion and a 19 kHz waveform for phase comparison. The received pilot is coupled to a phase detector in the phase locked loop through a high pass filter formed of passive components. A pilot detector uses EXCLUSIVE OR gates coupled to the frequency divider to develop a 19 kHz waveform in phase with the pilot for phase comparison with the received composite signal to determine the presence of the received pilot.

3,714,596

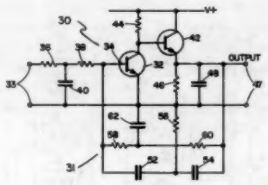
METHODS AND APPARATUS FOR FM DEMODULATION USING NON-LINEAR AMPLIFYING AND/OR FEEDBACK PATHS

Digjit Singh, Waltham, Mass., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 11, 1971, Ser. No. 105,371

Int. Cl. H03d *1/06*

U.S. Cl. 329—192 **15 Claims**



This disclosure depicts systems and methods especially for demodulating a narrow band of frequency-modulated signals. In one embodiment a closed-loop amplification system has a negative feedback circuit comprising a highly frequency-selective RC filter network. Another embodiment discloses the use of combined positive and negative feedback having a net negative effect. Each system includes at least one non-linear component to cause the system frequency response to have a substantially linear negative slope across the said band of frequencies.

3,714,597

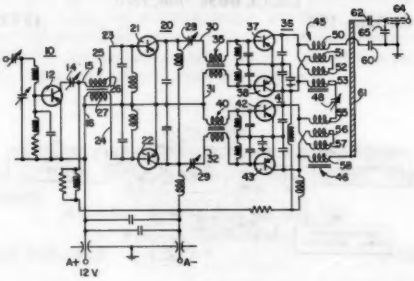
BROADBAND POWER AMPLIFIER WITH MULTIPLE STAGES CONNECTED BY BALUN TRANSFORMERS

Gary R. Reynolds, Streamwood, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 4, 1970, Ser. No. 69,532

Int. Cl. H03f *3/04*

U.S. Cl. 330—14 **7 Claims**



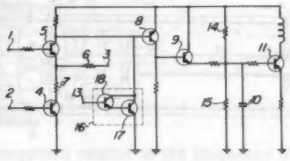
Broadband power amplifier including a single ended stage coupled to a plurality of stages by use of balun transformers. Broadband operation is achieved by use of balun transformer having interwinding capacitance which forms a shunt element, and high power is provided by use of a plurality of stages contributing to the load. A first single ended stage may be coupled by a one-to-one balun to a pair of push-pull stages, which in turn may be coupled through balun transformer to two pair of push-pull transistor stages. Alternately the single ended stage can be connected by two balun transformers to two pair of push-pull stages, or may be connected by three or more balun transformers to a like number of single ended stages. The outputs can be combined by use of a plurality of balun transformers coupled in series and each providing impedance step-up or by use of transformers, to thereby provide the desired output impedance of the amplifier.

3,714,598

AUTOMATIC GAIN CONTROL AMPLIFIER

Shuzo Wakai, Kyoto, and Mitsuo Nabae, Takatsuki, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed March 22, 1971, Ser. No. 126,457
Claims priority, application Japan, March 27, 1970, 45/26352
Int. Cl. H03g 3/30
U.S. Cl. 330—29 4 Claims



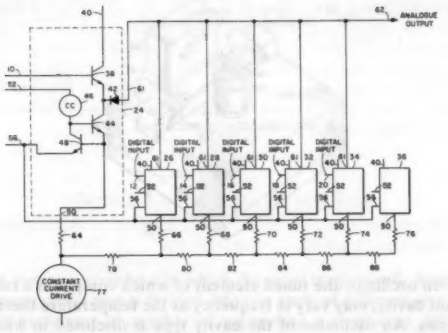
An AGC amplifier having a Darlington pair as a noise gate circuit for preventing the development of unwanted AGC outputs due to noise pulses. The Darlington pair develops a larger overdrive with the same base current than if a single transistor is employed, so a longer storage time of the transistors results, lengthening the gate period. This makes available an AGC amplifier circuit with a noise gate circuit whose gate period is longer without using a capacitor, thereby providing a convenient means for application to monolithic integrated circuits.

3,714,599

LADDER TERMINATION CIRCUIT

James Barton Cecil, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed March 24, 1971, Ser. No. 127,503
Int. Cl. H03f 3/68
U.S. Cl. 330—19 6 Claims



An improved and simplified termination circuit for the ladder portion of a digital to analog converter. the termination circuit includes an amplifier having unity current factor, known ladder termination voltage, and a very low impedance looking from the ladder into the amplifier.

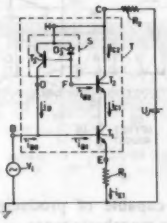
3,714,600

TRANSISTOR AMPLIFIER

Karel Elbert Kuijk, and Abraham Hoogendoorn, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed March 16, 1971, Ser. No. 124,828
Claims priority, application Netherlands, March 19, 1970, 7003900
Int. Cl. H03f 3/42; H03g 3/30
U.S. Cl. 330—25 5 Claims

The invention relates to a transistor amplifier in which steps have been taken to reduce the input current of the amplifier. The steps consist in the inclusion of a measuring transistor in the collector circuit of an input transistor of the amplifier and in the inclusion of a "current mirror" between the base of the measuring transistor and the base of the input transistor. The



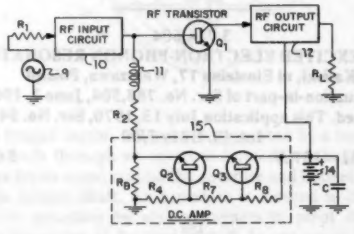
base of the measuring transistor has been connected to the low-resistance input of the current mirror and the base of the input transistor has been connected to the high-resistance output of the current mirror.

3,714,601

VARIABLE DIRECT CURRENT BIAS CONTROL CIRCUIT FOR LINEAR OPERATION OF RADIO FREQUENCY POWER TRANSISTORS

Robert Minton, Piscataway, and Constantine Kamnitsis, Stockton, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 14, 1971, Ser. No. 189,439
Int. Cl. H03g 3/30
U.S. Cl. 330—29 1 Claim



A variable direct current (D.C.) bias control circuit for linear gain operation of a radio frequency (R.F.) power transistor having a DC amplifier coupled to sense the change in voltage drop across a biasing resistor of the RF power transistor and operative to maintain this voltage drop constant to provide a linear gain of the power transistor throughout 10 percent to 90 percent of its rated power output within a 1½ decibel (db) variation.

3,714,602

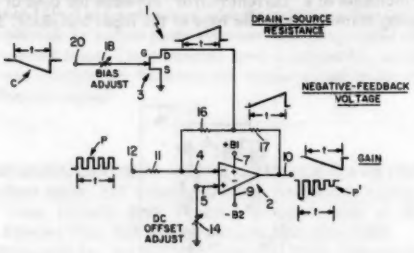
AMPLIFIER CIRCUIT HAVING A CONTROLLABLE GAIN

Frank G. Macey, Shrewsbury, Mass., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed Nov. 12, 1970, Ser. No. 88,595
Int. Cl. H03f 1/36
U.S. Cl. 330—86 1 Claim

A signal amplifying circuit including an operational amplifier and a single field effect transistor for controlling the gain of

the operational amplifier while producing minimal DC offset voltage at the output of the operational amplifier. The operational amplifier is capable of producing amplified output signals from dc to the megahertz range.

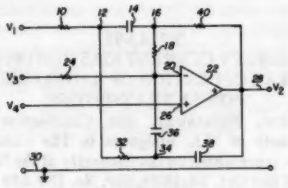


3,714,603

RC ACTIVE FILTER APPARATUS

Jerry G. Williford, Tustin, Calif., assignor to Collins Radio Company, Dallas, Tex.

Filed Sept. 27, 1971, Ser. No. 183,910
Int. Cl. H03f 3/50
U.S. Cl. 330—109 **3 Claims**



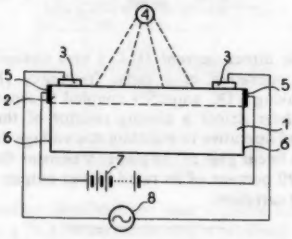
A complex filter or filter section using an amplifier with a plurality of feedback loops which may be used for bandpass filtration or for filters requiring complex transmission zeros.

3,714,604

SELF-EXCITED ELECTRON-PHONON RESONATOR

Sylwester Kaliski, ul Einsteina 17, Warszawa, Poland

Continuation-in-part of Ser. No. 788,504, June 2, 1969, abandoned. This application July 13, 1970, Ser. No. 54,498
Int. Cl. H01v 7/00
U.S. Cl. 331—107 A **5 Claims**



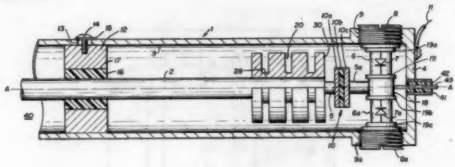
A method of obtaining an unlimited, in linear range, resonance of a piezoelectric surface wave by providing a piezoelectric semiconductor crystal having surfaces fulfilling Sommerfield boundary condition requirements, irradiating said crystal to establish therein a thin, near surface semiconducting layer to thereby generate surface waves in said layer, and amplifying said waves by applying a high voltage direct current to said layer; in addition, high frequency signals may be applied to said layer.

3,714,605

BROAD BAND HIGH EFFICIENCY MODE ENERGY CONVERTER

Martin I. Grace, Framingham, Mass.; Harry Kroger, Sudbury, Mass., and Harold J. Pratt, Andover, all of Mass., assignors to Sperry Rand Corporation

Filed Dec. 30, 1970, Ser. No. 102,738
Int. Cl. H03b 7/14
U.S. Cl. 331—107 R **3 Claims**



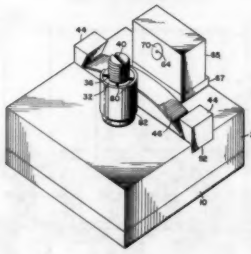
An active high-efficiency-mode semiconductor diode energy converter for generating and amplifying high frequency electromagnetic energy over a broad band frequency band utilizes balanced circuits affording independent tuning of signals at the several important frequencies for high-efficiency mode operation.

3,714,606

TEMPERATURE COMPENSATED TUNER AND OSCILLATOR

Lawrence O. Friend, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 4,688, Jan. 21, 1970, abandoned. This application July 12, 1971, Ser. No. 162,019
Int. Cl. H03b 7/14
U.S. Cl. 331—107 R **5 Claims**



An oscillator the tuned element of which comprises a resonant cavity, may vary in frequency as the temperature thereof varies. An oscillator of the cavity type is disclosed in which means are provided to reduce the variation of oscillator frequency with temperature change comprising a dielectric rod and means to move the rod more or less into the cavity comprising a pre-stressed metallic element which is held in a bowed shape by another metallic element, the temperature co-efficients of expansion of the two metallic elements being different.

3,714,607

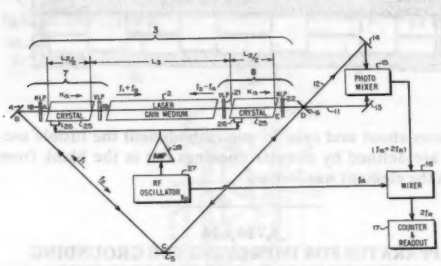
ACOUSTO-OPTIC METHOD AND APPARATUS FOR MODE DECOUPLING A RING LASER

Leonard S. Cutler, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 7, 1970, Ser. No. 61,915
Int. Cl. H01s 3/11
U.S. Cl. 332—7.51 **7 Claims**

An acousto-optic method and apparatus is disclosed for mode decoupling a ring laser. A pair of acousto-optic filters is

disposed in the optical path of the ring laser for collinearly diffracting the counter rotating light beams on acoustic waves in the acousto-optic filters to shift apart the optical frequencies of the counter rotating light beams in the laser gain medium by



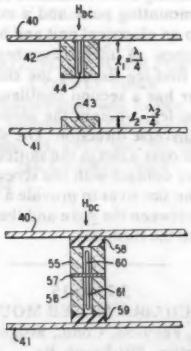
a certain frequency related to the frequency of the acoustic waves to prevent mode locking of the optical frequencies of the counter rotating light beams. A rotation rate sensor employing the mode decoupled ring laser is disclosed.

3,714,608

BROADBAND CIRCULATOR HAVING MULTIPLE RESONANCE MODES

Clare Earl Barnes, Bethlehem, Pa., and Brian Owen, Wescosville, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 29, 1971, Ser. No. 157,838
Int. Cl. H01p 1/32, 5/12
U.S. Cl. 333—1.1 **10 Claims**



A junction circulator in which the usual magnetically biased gyromagnetic post is divided into two parts of different size so that each part is capable of supporting a resonance mode respectively spaced from the other in frequency within the intended broadband of the circulator to extend the range in which the mode phase relationship required for circulation is extended. Conductive cores may be located in one or both of the parts or the parts may be located in separately formed conductive cavities to introduce other mode resonances to further extend the band.

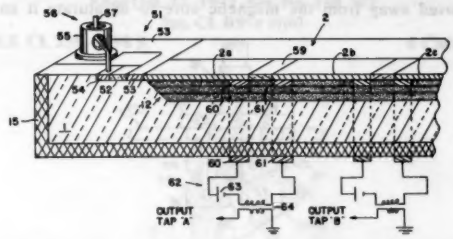
3,714,609

MICROWAVE ULTRASONIC DELAY LINE

David J. Whitney, Old Manchester Road, Amherst, N.H., and Terry F. Newkirk, 12 Longbow Circle, Lynnfield, Mass.

Continuation-in-part of Ser. No. 656,273, July 26, 1967, abandoned. This application July 31, 1970, Ser. No. 60,151
Int. Cl. H03h 7/30, 9/30
U.S. Cl. 333—30 R **9 Claims**

An ultrasonic delay line for use at microwave frequencies is provided in a thin epitaxial strip of ultrasonic wave conducting material laid down on a substrate body. An input transducer launches ultrasonic waves into the epitaxial strip at one end and an output transducer detects the ultrasonic waves at the other end of the strip. The major surfaces of the epitaxial strip are preferably adjacent a medium such that the interface



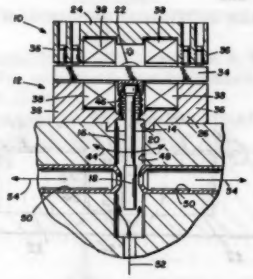
therewith is highly reflective to the ultrasonic waves and the thickness of the epitaxial strip is precisely determined when it is formed so that the thickness is of the same order of magnitude as the inflection thickness for the material at an ultrasonic frequency in the microwave range.

3,714,610

TORQUE MOTOR

Billy E. Duff, Sandy, Utah, and Gerald R. Taliaferro, Arlington, Tex., assignors to LTV Electrosystems, Inc., Dallas, Tex.

Filed Aug. 13, 1971, Ser. No. 171,669
Int. Cl. H01f 7/08
U.S. Cl. 335—229 **12 Claims**



In a torque motor, a flapper is supported by a torsion shaft and extends through an aperture formed in a base. A metal bellows forms a seal around the aperture and between the base and the torsion shaft. An armature is secured to the torsion shaft for actuation by electromagnets to pivot the flapper against the action of the torsion shaft. In one use of the torque motor the flapper includes a blade which is normally centered between opposed nozzles and which is operable upon actuation of the electromagnets to restrict or close either of the nozzles.

3,714,611

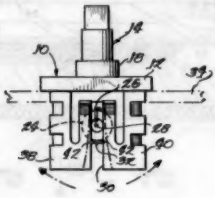
SOLID STATE SWITCH CONSTRUCTION

Robert C. Madland, Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 18, 1971, Ser. No. 199,872
Int. Cl. H01f 7/08
U.S. Cl. 335—229 **9 Claims**

A solid state switch construction employing a saturable magnetic core switch. The switch has a keystem of magnetic material to change the magnetic property of the saturable magnetic core to effect switching of the signal information by transformer coupling. The keystem has a pair of legs extending on opposite sides of the magnetic core with two permanent magnets secured thereto. When the keystem is not depressed

the magnets are located adjacent opposite sides of the core so that the magnetic flux path is formed through the magnetic core, the keystem, and the two permanent magnets to thereby saturate the magnetic core and prevent transformer coupling. When the keystem is depressed, the permanent magnets are moved away from the magnetic core to unsaturate it and



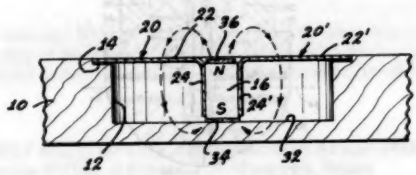
variations in the magnetic field effect witching of signal information. The magnetic core is readily removable from the key construction without electrically disconnecting the leads from the circuitry to which they are connected should a malfunction of the switch body or keystem occur. The magnetic core is firmly but removably held within the switch body by a metal clip.

3,714,612

CREATIVE MAGNET APPARATUS

Jerry P. Kayle, Sherman Oaks, Calif., assignor to Pacific Game Company, North Hollywood, Calif.

Filed Nov. 12, 1970, Ser. No. 88,883
Int. Cl. H01f 7/02
U.S. Cl. 335—285 **6 Claims**



Magnetic toy comprising a permanent magnet having north and south poles and juxtaposed magnetic pole pieces or pole shoes associated with the magnet, which establish a magnetized platform that extends the field so that magnetizable pieces of material of various shapes and sizes can be joined and erected on the platform and held together by magnetic forces. A circular recess or bore is provided in a piece of nonmagnetic material such as wood. The magnet is disposed diametrically in the bore or recess. The shoes or pole pieces, preferably comprise two generally semicircular platform areas each having a depending leg juxtaposed against the sides of magnet in the bore.

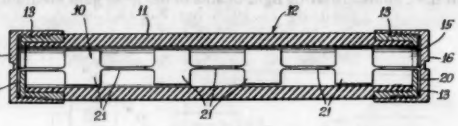
3,714,613

CANTED FUSE ELEMENT

Arthur I. Appleton, c/o Appleton Electric Company, 1701 W. Willington, Chicago, Ill.

Filed Nov. 1, 9171, Ser. No. 194,377
Int. Cl. H01h 85/08
U.S. Cl. 337—295 **5 Claims**

A fuse element comprises a plurality of planar heat sinks connected by integral fusible sections relatively small compared to the heat sinks. The heat sinks all have a common axis disposed in the planes thereof, which axis extends through the fusible sections. Adjacent heat sinks have different angular



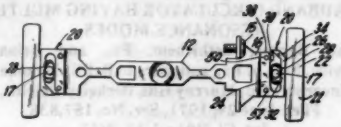
positions about said axis. In one embodiment the fusible sections are defined by circular openings cut in the blank from which the element was formed.

3,714,614

APPARATUS FOR IMPROVING THE GROUNDING CONNECTION FOR AN ELECTRICAL UNIT

Louis Ludwig, 310 East 44th Street, New York, N.Y.

Filed Oct. 7, 1971, Ser. No. 187,285
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R **8 Claims**



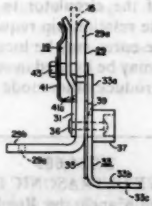
Apparatus for making a low resistance electrical connection between a metal mounting yoke and a metal flush box. The yoke is attached to an electrical unit and has a slotted portion for receiving a screw. A metal member is provided, said member having a first leg fixed to the slotted portion of the yoke. The member has a second cantilevered leg positioned parallel to the first leg, wherein the second leg is resiliently movable in the transverse direction. The second leg is at least partially positioned over a slot in the slotted portion to provide a yieldable pressure contact with the screw when the screw is inserted through the slot so as to provide a low resistance electrical connection between the yoke and the flush box when the screw is threaded to the flush box.

3,714,615

DETACHABLE METER MOUNTING

Kenneth R. Coley, Fairfield, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 1, 1971, Ser. No. 111,546
Int. Cl. H01r 13/12
U.S. Cl. 339—112 R **9 Claims**



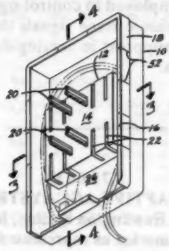
A meter mounting is provided with contact jaws which are mounted on a thermally-conductive terminal bracket. The contact jaws are electrically insulated from the terminal bracket by means of a sheet of insulation which has good thermally-conductive properties.

3,714,616

ELECTRICAL WALL RECEPTACLE COVER

Donald W. Sample, 2262 Vistamar Road, Toledo, Ohio

Filed Oct. 12, 1970, Ser. No. 79,924
Int. Cl. H01r 13/50
U.S. Cl. 339—159 R 11 Claims



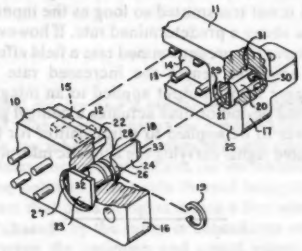
A cover for electrical wall receptacles. The cover has prongs which fit into the sockets of the wall receptacle to hold the cover in place and provide electrical connections to sockets provided on the inside of the cover for receiving the usual electrical cord plugs. The sockets are positioned in a pedestal having clearance with respect to the sides of the cover, so that the electrical cords can be wrapped around the pedestal inside of the cover. The sockets are preferably formed by slits in the side edge of the pedestal so that the prongs of the electrical plug can be slid edgewise into the sockets, and so that the pedestal need have a height substantially no greater than the thickness of the usual electrical cord plug.

3,714,617

SNAP IN POLARIZING MEMBER FOR ELECTRICAL CONNECTORS

Edward J. Bright, Bainbridge, and LeRoy W. Fairbairn, Sidney, both of N.Y., assignors to The Bendix Corporation

Filed Sept. 28, 1971, Ser. No. 184,382
Int. Cl. H01r 13/64
U.S. Cl. 339—186 M 8 Claims



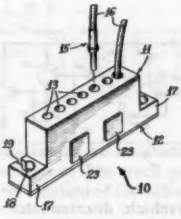
A guidance and polarizing means for the main parts of a separable electrical connector which carry mating electrical contacts. The polarizing means has two polarizing members (male and female) mounted in predetermined positions on the respective connector parts. Each member has a portion which interfits with the other member to permit connector parts to be mated only when the correct connector parts are presented to each other. In the embodiments shown, one polarizing insert is made of yieldable plastic material having projections thereon which extend into a recess in the connector body. This permits the polarizing insert to be snapped into a bore in the connector body and retained by the projections which are held captive in said recess.

3,714,618

TERMINAL BLOCK CONNECTORS

Arthur I. Appleton, c/o Appleton Electric Company, 1701 West Wellington, Chicago, Ill.

Filed Oct. 12, 1971, Ser. No. 188,162
Int. Cl. H01r 9/00
U.S. Cl. 339—198 R 6 Claims



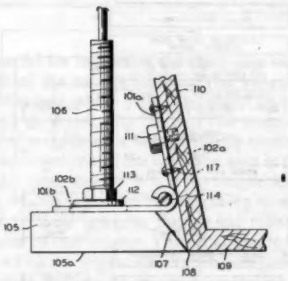
A terminal block connector of the feed-thru or feedback variety for use preferably with a standard pin contact. The pin contact is retained within the terminal block by a metal tang struck outwardly from a flat piece of sheet metal, and the electrical contact within the terminal block is struck outwardly from the same piece of sheet metal. This piece of sheet metal resides within a slot within the terminal block body, and the retainer and contact tangs extend into the cavities which receive the male contacts.

3,714,619

UNIVERSAL TRANSDUCER MOUNTING BRACKET AND ASSEMBLY

Robert A. Morgan, State College, and Paul A. Rishel, Centre Hall, both of Pa., assignors to Maschinenfabrik Gehring KG, Nellingen A.F., Germany

Filed Sept. 15, 1971, Ser. No. 180,617
Int. Cl. H04r 1/44; A47f 5/10
U.S. Cl. 340—8 S 6 Claims

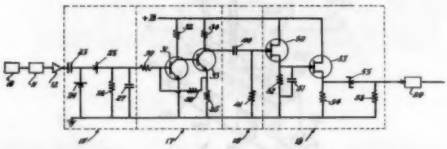


A mounting bracket includes a rectangular plate having an elongated alignment opening and mounting holes therein. Integral with one transverse edge of the plate are a pair of staggered bent hinge portions. An acoustic transducer housing has an exteriorly threaded stem extending therefrom and a bevelled leading edge. The stem extends through the alignment opening of a first plate with the hinge portions extending toward the boat. A second plate is attached to the transom of the boat. The plates are connected by a bolt extending through the hinge portions with the front of the bevelled edge of the housing contacting the edge of the hull of the boat. The position of the housing with respect to the transom is adjustable by means of the elongated alignment openings in the bracket plates.

3,714,620
SONIC AIRCRAFT/VEHICLE DISCRIMINATOR

Steven Biren, Glen Oaks, and Thomas V. Costello, Bronx, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 18, 1970, Ser. No. 99,404
Int. Cl. H04b *11/00*
U.S. Cl. 340—15 **4 Claims**

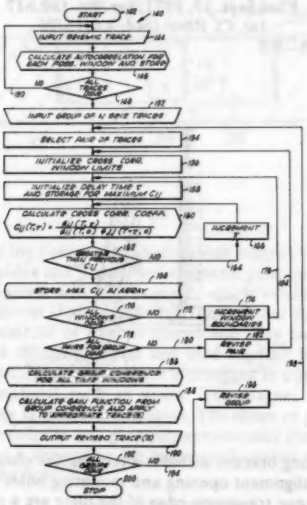


A sonic aircraft/vehicle discriminator adapted to receive sonic signals from both aircraft and land motor vehicles provides an output signal on receiving aircraft signals and a null on receiving the vehicle signals. The system by detecting slower fluctuations and less variations in the amplitudes of the vehicle signals than the aircraft signals subsequently attenuates the vehicle signals. The discriminator is comprised of serially connected filters, amplifiers, envelope detector, differentiator, integrator and Schmitt trigger.

3,714,621
METHOD AND APPARATUS FOR SEISMIC GAIN CONTROL THROUGH SEISMIC SIGNAL COHERENCE

Kenneth H. Waters, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Dec. 30, 1970, Ser. No. 102,729
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 TC **8 Claims**

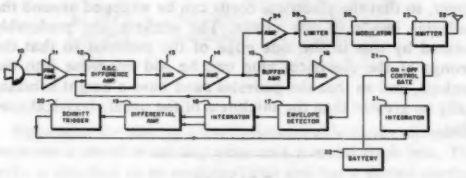


The method consists of deriving a coherence measure from selected related traces of a seismic cross-section, and thereafter weighting individual or selected ones of the seismic traces in accordance with such time-analogue coherence quotient. Apparatus for carrying out the method may consist of structure for imposing predetermined delay between each pair of a group of selected seismic traces with subsequent summation, multiplication and integration over a time period to provide a first integrated output; and each trace pair is then subjected to one or more other predetermined, different delays with respective outputs applied to the multiplier and integrator circuitry thereby to generate additional integrated outputs. All integrated outputs for each trace pair are then applied through sample and hold circuitry to select a time-varying maximum voltage signal for output as a coherence quotient signal. Thereafter, the coherence quotient signals for each trace pair are combined to form a signal of time-varying character which is employed to control signal gain through duration of selected seismic trace signals thereby to selectively allow passage or to suppress in varying degrees the final output signal indications.

3,714,622
ADAPTIVE AGC SYSTEM

Carl R. Wilhelmsen, Huntington Station, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 12, 1969, Ser. No. 884,419
Int. Cl. G08b *13/16*
U.S. Cl. 340—16 **8 Claims**



Acoustic information is applied to a transducer and the electrical signal from the transducer is supplied to a modulator and transmitted if the signal both exceeds a predetermined level for a specified period of time and increases during this time above a specified rate. This is attained by applying the electrical signal to an AGC difference circuit with a feedback control so that the AGC difference circuit provides a constant output that is not transmitted so long as the input signal does not increase above a predetermined rate. If however the signal increases above the predetermined rate a field effect transistor difference amplifier senses the increased rate and fires a Schmitt trigger whose output applied to an integrator circuit for a specified period of time actuates a control gate enabling battery power to be applied to a transmitter for transmission of a modulated signal carrying the acoustic information.

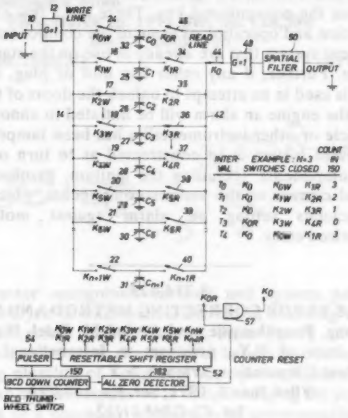
3,714,623
MEMORIZER

Brian E. Mickler, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed June 8, 1971, Ser. No. 151,036
Int. Cl. G01v *1/32*; H03k *5/159*; G11c *11/24*
U.S. Cl. 340—18 R **43 Claims**

A system is disclosed for individually storing dc voltage values of an applied continuous voltage sampled at controlled intervals, extracting the dc voltage samples at predetermined intervals later, and reconstructing a continuous voltage from the extracted voltages to produce a resultant continuous wave voltage that closely resembles the applied continuous wave voltage. The sampling time interval may be modified in accordance with variation of an independent time-related func-

tion, such as the time required to achieve a predetermined distance traversal. Continuous changes in the sampling time

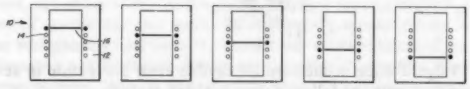


interval are automatically accommodated in the operation of the storing, extraction and reconstruction operations.

3,714,624
DISPLAY SYSTEM

Anne W. Story, Cambridge, Mass., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed July 16, 1970, Ser. No. 55,535
Int. Cl. G08g *5/00*
U.S. Cl. 340—27 R **4 Claims**



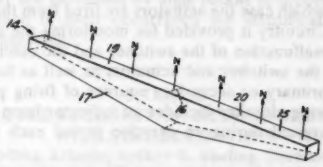
A situational display and a means for creating the display are disclosed. The display comprises a moving line or raster, on a cathode ray tube, which is disposed intermediate of two columns of lamps or intensifications on the cathode ray tube; the raster and lights to either side thereof being controlled in such a manner that pairs of lights define a line which is either tracked or "chased" by the raster in accordance with the relationship between the optimum and actual values of a monitored parameter.

3,714,625
VEHICLE GUIDANCE TRACK OF TRANSVERSE EXTENT

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed March 30, 1971, Ser. No. 129,521
Int. Cl. G08g *1/09*; E01f *11/00*
U.S. Cl. 340—32 **12 Claims**

A vehicle guidance track comprising a plurality of magnet installations aligned in spaced relation on the longitudinal axis of the track and extending in a direction transverse to the longitudinal axis. The magnet installations change, and correspondingly the magnetic fields of the installations change,

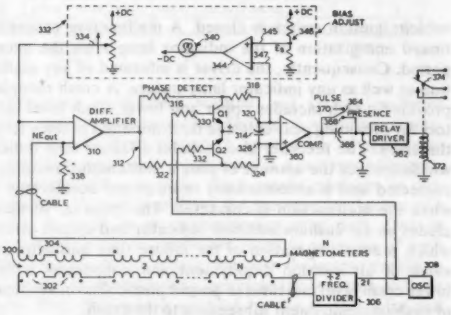


over the transverse extent of the installation. Thus, flux sensors in vehicles traveling over the track generate signals that indicate the transverse location of the vehicles on the track.

3,714,626
VEHICLE DETECTION SYSTEM

Ralph J. Koerner, Canoga Park, Calif., assignor to Canoga Controls Corporation, Canoga Park, Calif.

Filed March 18, 1971, Ser. No. 125,724
Int. Cl. G08g *1/00*
U.S. Cl. 340—38 L **18 Claims**



A system useful for indicating the entry of a vehicle onto a specified area of the earth's surface. The system includes a magnetic field sensor which yields an output signal indicative of the magnetic field intensity thereat. The sensor is mounted adjacent to but outside of a volume being monitored which constitutes the projection of the specified area in the direction of the magnetic field thereat. When the magnetically permeable mass of a vehicle enters the volume being monitored, it increases magnetic field intensity therein but reduces the field intensity outside of this volume. The reduction in field intensity is recognized by the sensor which then energizes an indicating device, which in the case of a service station installation, for example, can be a remote bell. The sensor preferably comprises a flux gate magnetometer.

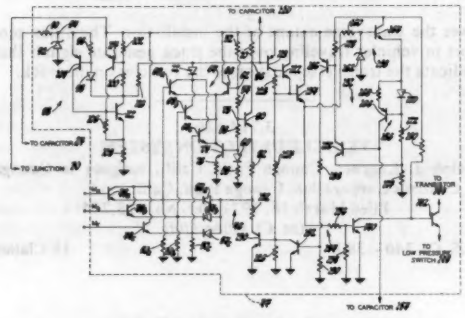
3,714,627
VEHICLE INFLATABLE CUSHION ACTUATION AND MONITORING CIRCUIT

Ned E. Dillman, Kokomo, Ind.; Arden G. Gillund, Oak Creek, Wis.; Victor O. Muth, Pittsford, N.Y., and Pasquale Recupito, New Berlin, Wis., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1971, Ser. No. 190,978
Int. Cl. B60r *21/08*
U.S. Cl. 340—52 H **7 Claims**

The actuation circuit includes a plurality of electrically operated actuators for controlling the inflation of a plurality of

inflatable cushions located in a vehicle in response to closure of condition responsive switches. The series circuit formed by the switches and actuators is connected with a battery and a storage capacitor which form primary and secondary sources of direct current firing potential. The actuators are fired from the battery during a collision upon concurrent closure of the switches unless battery power is not available as a result of the collision in which case the actuators are fired from the storage capacitor. Circuitry is provided for monitoring the actuation circuit for malfunction of the switches and the cabling interconnecting the switches and actuators as well as for loss of either the primary or secondary sources of firing potential. The monitoring circuitry includes an indicator lamp which is initially energized during an exercise period each time the



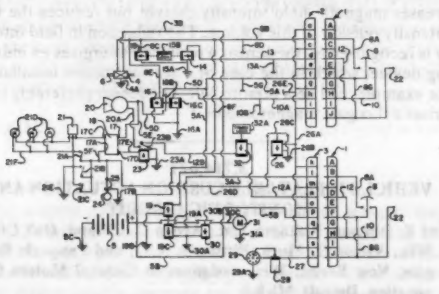
vehicle ignition switch is closed. A malfunction causes continued energization of the indicator lamp after the exercise period. Consequently, the driver is informed of any malfunction as well as any indicator lamp outage. A crash recorder is provided which includes upper and lower crash level indicators for providing post-collision determination of the *q* level of the crash. The recorder also includes a failure time indicator which records the amount of time a malfunction remains uncorrected and is automatically reset at any accelerated rate when the malfunction is corrected. The recorder further includes an air cushion inflation indicator and circuit interrupt which prevents operation of the failure time indicator in the event of air cushion deployment and cooperates with the lower crash level indicator to permit post-collision verification of cushion deployment subsequent to the crash.

3,714,628

VEHICLE ELECTRICAL LOCKING AND ALARM SYSTEM

Thomas L. Sloger, R. D. 2, Tippecanoe Road, Canfield, Ohio

Filed Nov. 3, 1971, Ser. No. 195,418
Int. Cl. B60r *25/04, 25/10*
U.S. Cl. 340—64 **11 Claims**



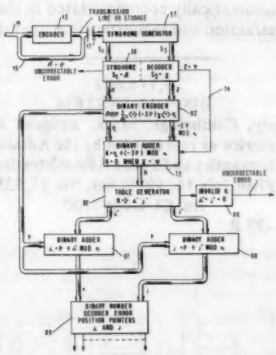
The present invention, when applied to a vehicle, or other instrumentality, is to prevent unauthorized use of the vehicle or other device on which it is installed, and to prevent tampering with any component attached to the vehicle or device. This is accomplished by eliminating the conventional cylinder and tumbler locks and replacing them with a multiple contact plug and socket. With a special key unit, coded, matched and mated with a door and/or with an ignition unit, the owner may lock and unlock the doors and/or trunk, start and drive the vehicle, and turn off the ignition, in much the same way he would use the conventional key. There are a few changes in the location and operation of some of the components used in the present system that are already in use on the standard automobile. Further, if any other key unit or plug, or "jump wiring" is used in an attempt to unlock the doors of the car or to start the engine an alarm will be initiated to announce that the vehicle or other instrumentality has been tampered with. The present system is so constructed as to turn off all the major components, including the ignition, gasoline supply, electrical current to the various components, which system also includes setting an alarm against motion and unauthorized entry.

3,714,629

DOUBLE ERROR CORRECTING METHOD AND SYSTEM

Se J. Hong, Poughkeepsie, and Arvind M. Patel, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 1, 1971, Ser. No. 148,773
Int. Cl. G06f *11/12*
U.S. Cl. 340—146.1 AL **12 Claims**



A cyclic code is encoded for double error correction in accordance with the following parity check matrix:

$$H=\left[\frac{\alpha^1\ \alpha^2\ \ldots\ \alpha^i\ \ldots\ \alpha^n}{(\alpha^3)^1(\alpha^3)^2\ \ldots\ (\alpha^3)^i\ \ldots\ (\alpha^3)^n}\right]$$

where the code length n is given by 2^m-1 and α is a primitive element of $GF(2^m)$ represented by a binary column vector. Decoding of the coded message requires establishing a one to one correspondence between $n^2+n/2$ distinct error patterns and the corresponding syndromes. The $n^2+n/2$ distinct syndromes are mapped into $n+1/2$ fixed syndromes by an arithmetic operation as follows:

The syndrome is obtained in two parts for an error in each of digit positions i and j given by:

$$S=\begin{bmatrix}S_1\\S_3\end{bmatrix}=\begin{bmatrix}\alpha^i\oplus\alpha^j\\\alpha^{3i}\oplus\alpha^{3j}\end{bmatrix}=\begin{bmatrix}\alpha^p\\\alpha^q\end{bmatrix}$$

This syndrome is mapped into:

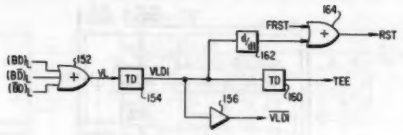
$$S'=\begin{bmatrix}S'_1\\S'_3\end{bmatrix}=\begin{bmatrix}\alpha^0\\\alpha^{q-3p}\end{bmatrix}=\begin{bmatrix}\alpha^{i-p}\oplus\alpha^{j-p}\\\alpha^{3(i-p)}\oplus\alpha^{3(j-p)}\end{bmatrix}$$

There are only $n+1/2$ distinct values of S′ to cover all possible single and double errors. The error positions resulting from the corresponding S′ are then mapped into actual error locations i and j.

3,714,630
CHARACTER RECOGNITION METHOD AND SYSTEM WITH LEADING/TRAILING EDGE CONTROL

John A. Cribbs, Atlanta, Ga., assignor to Data Card Corporation, Minneapolis, Minn.

Filed March 26, 1971, Ser. No. 128,380
Int. Cl. G06k 9/06
U.S. Cl. 340—146.3 J 21 Claims



A character recognition method and system performs dynamic analysis of information derived in scanning characters for character recognition. A linear array of plural scanning elements scans characters to be recognized in a corresponding plurality of horizontal scan paths. Each element produces an output responsive to and identifying the presence or absence of a character segment in its corresponding scan path. One or more successive sets of conditions result in scanning of each character in accordance with a change in the output condition of any element. Character recognition is performed in accordance with the detection of a prescribed sequence of preselected sets of leading, of central, and of trailing edge conditions uniquely related to each character of the plurality of characters to be recognized. Each of the leading edge, central, and trailing edge conditions derived from the scanning are stored and subjected to further processing for the recognition function in accordance with timing controls which assure that the output conditions of all scanning elements have been accurately determined before the logic decision circuitry identifies the set of conditions represented thereby. Further logic decision means requires that a valid leading edge condition is detected, before the central and trailing edge conditions are processed, in scanning each character. In addition to the sequentially enabled processing and timing control functions, selection of the leading edge, central, and trailing edge sets of conditions also serves to eliminate potential errors in the recognition functions resultant from modifications of the character configurations for aesthetic appeal, as well as from imperfections therein and misalignment thereof as occur in practical applications.

3,714,631
CHARACTER RECOGNITION METHOD AND SYSTEM

Raymond J. Deschenes, Atlanta, Ga., assignor to Data Card Corporation, Minneapolis, Minn.

Filed March 26, 1971, Ser. No. 128,387
Int. Cl. G06r 9/18
U.S. Cl. 340—146.3 WD 27 Claims

CHARACTERS	SETS OF CONDITIONS 1	2	3	4	5	STATES 1	2	3	4	5
0	ABCDE	ABCDE	ABCDE	—	—	X	M	X	—	—
1	ABCDE	ABCDE	ABCDE	ABCDE	—	X	NOT USED	X	X	—
2	ABCDE	ABCDE	ABCDE	—	—	T	P	S	—	—
3	ABCDE	ABCDE	ABCDE	—	—	NOT USED	P	X	—	—
4	ABCDE	ABCDE	ABCDE	ABCDE	—	Q	J	X	—	—
5	ABCDE	ABCDE	ABCDE	—	—	S	P	T	—	—
6	ABCDE	ABCDE	ABCDE	—	—	X	M	R	—	—
7	ABCDE	ABCDE	—	—	—	I	X	—	—	—
8	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	NOT USED	X	P	X	NOT USED
9	ABCDE	ABCDE	ABCDE	—	—	Q	L	X	—	—
SPACE	ABCDE					U				

A character recognition method and system performs dynamic analysis of information derived in scanning characters for character identification. A linear array of plural sensors scans characters to be recognized in a corresponding plurality of horizontal scan paths. Each sensor produces an output responsive to and identifying the presence or absence of a character segment in its corresponding scan path. One or more successive sets of conditions result in scanning of each character in accordance with a change in the output condition of any sensor. At least selected sets of conditions are decoded to define corresponding states. The states derived in scanning a character are processed by logic means in accordance with the sequence of their occurrence for identification of the scanned character.

3,714,632
CHARACTER RECOGNITION METHOD AND SYSTEM WITH STROBE CONTROL

John A. Cribbs, Atlanta; Arthur B. Abeling, Decatur, and Kenneth H. Breeden, Doraville, all of Ga., assignors to Data Card Corporation, Minneapolis, Minn.

Filed March 30, 1971, Ser. No. 129,341
Int. Cl. G06r 9/18
U.S. Cl. 340—146.3 WD 16 Claims

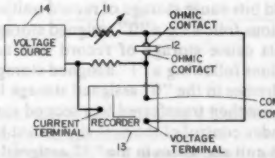
CHARACTERS	SETS OF CONDITIONS 1	2	3	4	5	SELECTED SETS OF CONDITIONS 1	2	STATES 1	2
0	ABCDE	ABCDE	ABCDE	—	—	ABCDE	ABCDE	Y	M
1	ABCDE	ABCDE	ABCDE	ABCDE	—	ABCDE	—	K	—
2	ABCDE	ABCDE	ABCDE	—	—	ABCDE	ABCDE	T	S
3	ABCDE	ABCDE	ABCDE	—	—	ABCDE	ABCDE	M	P
4	ABCDE	ABCDE	ABCDE	ABCDE	—	ABCDE	ABCDE	W	J
5	ABCDE	ABCDE	ABCDE	—	—	ABCDE	ABCDE	P	T
6	ABCDE	ABCDE	ABCDE	—	—	ABCDE	—	R	—
7	ABCDE	ABCDE	—	—	—	ABCDE	—	I	—
8	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	ABCDE	Z	P
9	ABCDE	ABCDE	ABCDE	—	—	ABCDE	—	L	—
SPACE	ABCDE							U	

A character recognition method and system performs dynamic analysis of information derived in scanning characters for character identification. A linear array of plural sensors scans characters to be recognized in a corresponding plurality of horizontal scan paths. Each sensor produces an output responsive to and identifying the presence or absence of a character segment in its corresponding scan path. One or more successive sets of conditions result in scanning of each character in accordance with a change in the output condition of any sensor. A strobe pulse is generated in response to these changes. Decoding means enabled by the strobe pulse and responsive to the sensor outputs for at least selected sets of conditions define corresponding states upon the occurrence of the respectively associated sets of conditions. The states as thus defined and derived in scanning a character then are processed by logic means in accordance with prescribed sequences of occurrence for identification of the scanned character.

3,714,633
SINGLE AND POLYCRYSTALLINE SEMICONDUCTORS

David J. Epstein, Watertown, and David C. Bullock, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 21, 1970, Ser. No. 65,819
Int. Cl. G11b 5/00
U.S. Cl. 340—166 R 22 Claims



A class of either single crystal or polycrystalline ferromagnetic materials containing an iron oxide whose resistivity vs. temperature characteristic is such that the resistivity decreased substantially with increasing temperature. The class

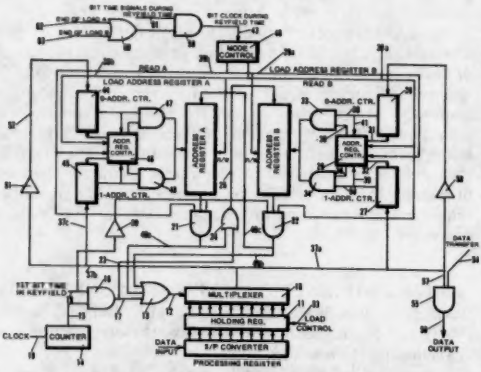
has non-linear current-voltage (I-V) properties (when employed in electric circuit devices) characterized by a high resistance branch and a negative resistance branch, and the class also exhibits binary characteristics in that devices embodying materials of the class can be made to operate either in a memory state (low resistance) or a normal state (high resistance). The material of the class is prepared by a process which modifies the electrical conductivity of the iron oxide, which is originally highly insulating and also ferromagnetic, to render the material slightly conductive or semiconductive. In the insulating state the oxide contains iron in the trivalent state Fe^{3+}). The process includes reduction of the iron in the insulating oxide either by heat treating in a vacuum or a controlled atmosphere gas or by doping to reduce some of the trivalent iron (Fe^{3+}) to bivalent iron (Fe^{2+}). The material properties are such that when said devices are operated in either the negative resistance branch or in the memory state the ferromagnetic curie point of the material is exceeded and the ordered magnetic properties of the material are locally destroyed. The local destruction can be sensed optically or by other means. The materials of the class disclosed may be used simply in conductive devices, but they can also be used in apparatus, as, for example, the matrices discussed hereinafter, which employ their multi-faceted electrical characteristics as well as their magnetic properties. Materials, which exhibit characteristics of the high resistance branch and the negative resistance branch and are ferroelectric, are also disclosed, as are, also, iron oxide materials which exhibit such characteristics and are neither ferromagnetic nor ferroelectric.

3,714,634

METHOD AND SYSTEM FOR SORTING WITHOUT COMPARATOR

Gerhard Dirks, Los Altos Hills, and Paul F. Schenck, Mountain View, both of Calif., assignors to Dirks Electronics Corporation, Sunnyvale, Calif.

Filed Jan. 7, 1971, Ser. No. 104,658
Int. Cl. G06f 7/06
U.S. Cl. 340—172.5 **44 Claims**



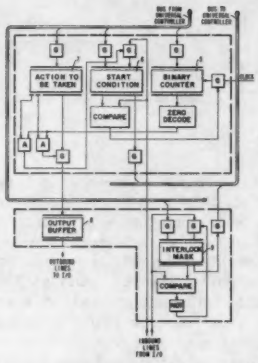
Record unit addresses, providing access to corresponding record units having keyfields, are stored in a first storage, each under control of the corresponding least significant keyfield bit. Zero keyfield bits cause storage of record unit addresses in sequential locations following a "0" assigned storage location; "1" keyfield bits cause storage of record unit addresses in sequential locations following a "1" assigned storage location. Record unit addresses in the "0" assigned storage locations of the first storage are then transferred to a second storage in the same manner under control of the next significant keyfield bit. Next, the record unit addresses in the "1" assigned storage locations of the first storage are so transferred to the second storage. The transfers are repeated under control of all keyfield bits, read-out from "0" assigned storage locations always preceding read-out from "1" assigned storage locations.

3,714,635

STANDARD ADAPTER METHOD AND APPARATUS

John Arthur Hamilton; David Robert Hughes, and Leo Thomas O'Connor, Jr., all of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1972, Ser. No. 222,189
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 **8 Claims**



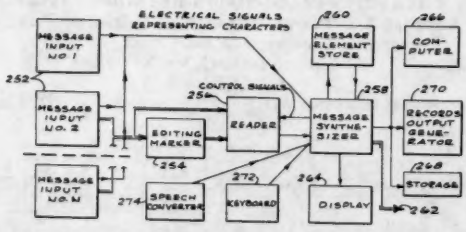
An adapter unit for facilitating communication between a computer and any one of a number of different input/output devices to which the computer may be connected is disclosed. Each adapter unit may be programmed to handle the various control parameters required for any particular input/output device, thus eliminating the necessity of a specifically designed, hard wired adapter unit for each different input and output device.

3,714,636

AUTOMATIC EDITING METHOD WITH PAGE FORMATTING

Ron Manly, 1922 West El Segrindo Boulevard, Gardena, Calif.

Division of Ser. No. 63,020, Aug. 11, 1970, Pat. No. 3,676,856, which is a continuation of Ser. No. 275,415, April 24, 1963. This application May 1, 1972, Ser. No. 249,216
Int. Cl. G06f 7/30, 3/08; G06r 5/00
U.S. Cl. 340—172.5 **6 Claims**

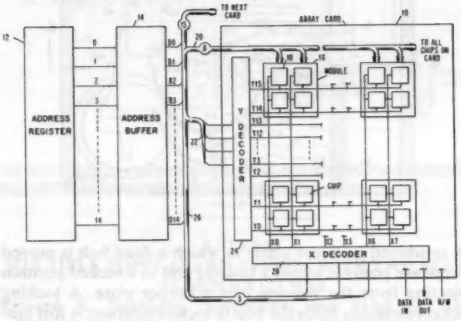


Methods and systems to avoid manually retyping or rekeyboarding textual material when revising or correcting the information contained in a record either while originally preparing the information or at a later date. The use of print readers or character recognition devices to accomplish this "editing" is disclosed, as well as editing using paper tape typewriters, display devices, and other means such as using editing instructions. Methods are also disclosed for automatically reformatting the information into lines after insertions, deletions, or other changes requiring shifting of the line layout of the information.

3,714,637
MONOLITHIC MEMORY UTILIZING DEFECTIVE STORAGE CELLS

William F. Beausoleil, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 30, 1970, Ser. No. 76,917
Int. Cl. G11c 7/00, 11/40
U.S. Cl. 340—173 R 7 Claims

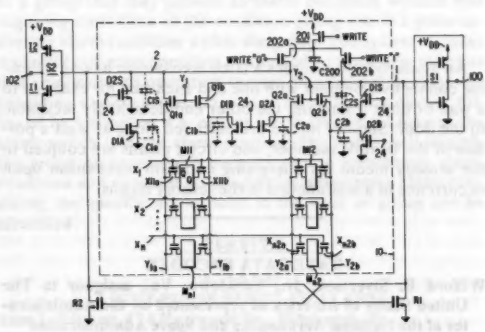


Transformation logic is provided in the addressing portion of a computer memory to permit the memory to be constructed of components containing defective bit cells. In the production of monolithic memory chips used in computer storage devices, a certain percentage is rejected in production as containing one or more defective bit cells on the chip. This apparatus arranges the almost perfect chips on a memory bit card so that all of the bit cards of a particular memory product are identical as to those sections containing defective bit cells. The valid cells are logically arranged in contiguous address locations by transformation logic which converts the address before it is presented to the memory bit cards. This circuitry places the defective bit positions in high order address locations which are not accessed.

3,714,638
CIRCUIT FOR IMPROVING OPERATION OF SEMICONDUCTOR MEMORY

Andrew Gordon Francis Dingwall, Somerville, N.J., and John Mulliner Jorgensen, Santa Clara, Calif., assignors to RCA Corporation, Somerville, N.J.

Filed March 24, 1972, Ser. No. 237,749
Int. Cl. G11c 11/40
U.S. Cl. 340—173 R 9 Claims

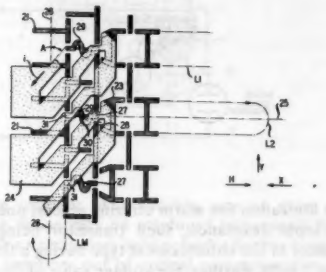


A pair of cross-coupled transistors connected to the two sense lines of an array of memory cells clamp one sense line to a low signal level in response to a high signal level on the other sense line.

3,714,639
TRANSFER OF MAGNETIC DOMAINS IN SINGLE-WALL DOMAIN MEMORIES

Donald Eugene Kish, North Plainfield, and James Lanson Smith, Bedminster, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1971, Ser. No. 205,075
Int. Cl. G11c 11/14, 19/00
U.S. Cl. 340—174 TF 17 Claims

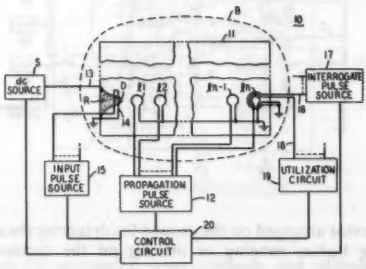


A magnetic arrangement for transferring a single-wall domain in a layer of magnetic material from one closed loop to another, both defined by magnetically soft elements includes a transfer conductor oriented to supply fields operative both to move a domain from its present position in one loop into a transfer region and to eliminate the attracting field generated in the next normal position for the domain in response to a magnetic field reorienting in the plane of the layer. The position to which the domain is moved in the transfer region is defined by a magnetically soft guide element.

3,714,640
SINGLE WALL DOMAIN PROPAGATION ARRANGEMENT

Andrew Henry Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 28, 1971, Ser. No. 147,853
Int. Cl. G11c 11/14, 19/00
U.S. Cl. 340—174 TF 8 Claims

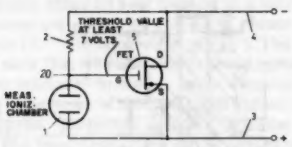


An external means for supplying a bias field of a polarity to contract single wall domains employed to insure the stability of single wall domains in a layer of a host magnetic material has been found to be unnecessary if a surface layer of the host material is prepared so that the surface is permanently magnetized normal to the plane of the host layer and exchange-coupled to the body of that layer.

3,714,641
IONIZATION FIRE ALARM

Andreas Scheidweiler, Stafa, Switzerland, assignor to Cerberus AG, Mannedorf, Switzerland

Filed March 13, 1970, Ser. No. 19,242
Claims priority, application Switzerland, March 27, 1969, 4629/69
Int. Cl. H01j *39/28*; G08b *17/10*
U.S. Cl. 340—237 S **13 Claims**

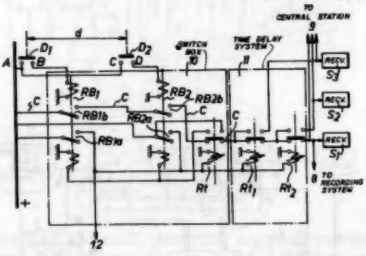


An ionization fire alarm utilizing at least one transistor with high input resistance, such transistor being a field-effect transistor of the enhancement type having a threshold voltage above 7 volts. Further, the voltage value of the voltage source and the resistance value of a resistor element are selected such that the voltage drop at the ionization chamber without the influence of combustion aerosols is smaller than the threshold voltage of the field-effect transistor so that the field-effect transistor is therefore non-conductive or blocked, and additionally these values are simultaneously chosen such that the field strength, in the chamber regions of the ionization chamber in which at least 85 percent of the ionization current flows, is smaller than 5 V/cm.

3,714,642
DEVICE FOR DETECTING THE SPEEDS OF MOVING BODIES

Jean Lavarenne, Villecresnes, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Nov. 13, 1970, Ser. No. 89,393
Claims priority, application France, Nov. 15, 1969, 6939376
Int. Cl. G08b *21/00*
U.S. Cl. 340—263 **4 Claims**



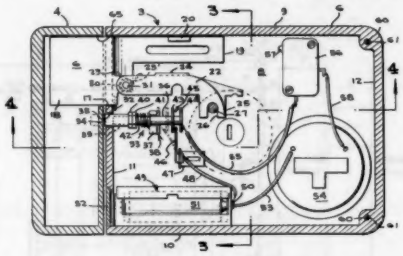
A device arranged on the ground for detecting the speeds of moving bodies running or moving on the surface of the ground.

It comprises two detectors which control, where actuated by the passage of the moving body, switches. Each of these latter opens simultaneously two circuits, at least one of which controls a time-delay system. The remaining two circuits, previously connected in series with each other and with the controlled time-delay system, form the utilization circuit in an open or closed condition which is a function of the state of the circuits of switching and time delay system, at the moment when the second detector is actuated.

3,714,643
COMBINED LOCK AND ALARM

Frank H. Sosin, G.P.O. Box 4486, San Juan, P.R., and Rene Cintron, P.O. Box 408, Toa Baja, P.R.

Filed March 11, 1971, Ser. No. 123,197
Int. Cl. G08b *13/08*
U.S. Cl. 340—274 **10 Claims**

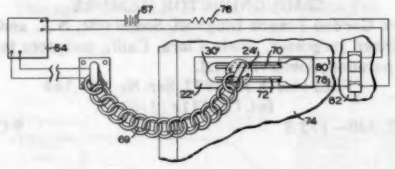


A combined lock and alarm in which a dead bolt is moved to a release position within a housing and to a locked position projecting from the housing into a keeper plate. A locking bracket releasably holds the bolt in locked position. A lost motion connection permits the bolt to move an alarm plunger into contact with the keeper plate and override to lock, leaving the plunger spring-urged toward the plate. Movement of the door on which the lock is mounted from closed position allows the plunger to drop into an opening in the keeper plate and close a circuit to an alarm. Retraction of the bolt also retracts the plunger and opens a switch to render the alarm circuit inoperative.

3,714,644
ALARMS FOR NIGHT LATCH

Harold Richard Hellstrom, 5245 Center Avenue, Pittsburgh, Pa.

Filed Nov. 25, 1970, Ser. No. 92,673
Int. Cl. G08b *13/08*, *13/12*
U.S. Cl. 340—274 **20 Claims**



An alarm system includes a latch mechanism having a flexible connective member with one end anchored for example to a wall or door frame and the other end detachably securable to the door. Sensory means are extended along at least a portion of the flexible member, and circuit means are coupled to the sensory means for energizing an alarm mechanism upon occurrence of a malfunction in the sensory means.

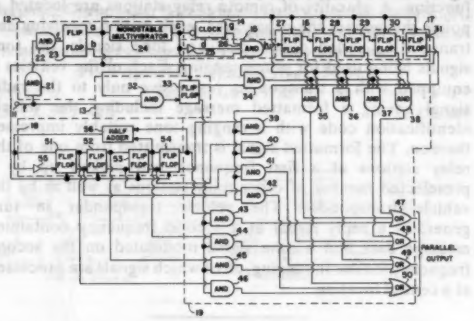
3,714,645
RATE DATA ENCODER

Wilford E. Sivertson, Jr., Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 26, 1970, Ser. No. 84,002
Int. Cl. G06m *3/02*
U.S. Cl. 340—347 AD **10 Claims**

Apparatus and technique for encoding rate data. The expected range of the rate data is determined and the data falling

within that range is encoded by conventional digital techniques. If the data falls either below or above the range,



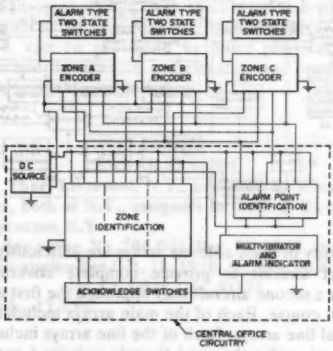
the encoding is stopped and signals are transmitted indicating that the data is not within the expected range.

3,714,646

MULTIPLE POINT ALARM SYSTEM WITH TWO STATE ALARM SWITCHES

Richard K. Nurnberg, Norristown, and Erich O. Koch, Philadelphia, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 21, 1970, Ser. No. 65,900
Int. Cl. G08b *23/00*
U.S. Cl. 340—412 **8 Claims**



An alarm system for monitoring a number of alarm points arranged in groups or zones at areas remote from a central station which permits identification of more than one alarm point in a group that may present an alarm condition without first requiring correction of the condition giving rise to a prior occurring alarm condition within the group. The system includes a plurality of zone encoders connected to the alarm switches and responsive to operation thereof to an alarm position for providing a pulse output to a zone identification circuit, followed by a constant d.c. output which remains as long as the alarm switch is in the alarm position. The system will identify the group or zone which presents even a momentary alarm condition and should it be a repetitive momentary alarm condition, the specific alarm point in the zone or group can be identified.

3,714,647

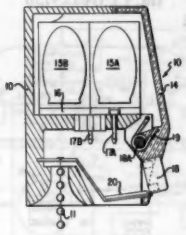
LIGHT PULSE BURGLAR ALARM

Alan L. Litman, 114 Hartwood Dr., Pittsburgh, Pa.

Filed April 26, 1971, Ser. No. 137,275
Int. Cl. G08b *13/08, 1/00*
U.S. Cl. 340—416 **14 Claims**

A light pulsating burglar alarm system and method is provided employing a plurality of separated photoflash units that are individually and selectively triggered upon the opening of a door, window, or other opening to produce a high intensity light pulse of predetermined optical characteristics.

A centralized detector selectively responds to the light pulse produced by anyone of these triggered units to annunciate the



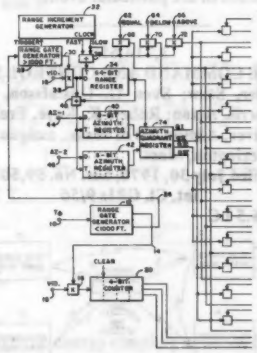
presence of the intruder. Alternatively, one or more light pulse producing relays may be employed to respond to the pulse and produce a secondary light pulse for further transmission to remote locations out of optical communication with the nuts.

3,714,648

TIME-TO-COLLISION CIRCUITRY FOR COLLISION WARNING SYSTEM

David B. Bennett; Robert J. Follen, both of Minneapolis, and Charles P. Harman, Jr., Roseville, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 22, 1971, Ser. No. 191,626
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 DP **5 Claims**

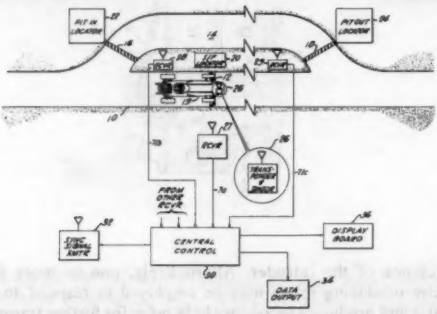


Circuitry for processing range, azimuth, and altitude data for determining time-to-collision (tau) between helicopters or other aircraft. Range data and azimuth data is received and stored in a fast, variable increment range register and fast azimuth registers respectively. Range data received at high rates is then transferred to two sets of slow registers in accordance with the azimuth and relative altitude of the range data. Results of successive sets of interrogations are compared to detect changes in range corresponding to a predetermined range of tau values.

3,714,649
VEHICLE RACE MONITORING SYSTEM

Frans Brouwer, Glencoe; William H. Englehardt, Skokie; Frank M. Krempel, Prospect Heights, and Robert A. Payne, Des Plaines, all of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed May 18, 1970, Ser. No. 38,017
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 R **20 Claims**

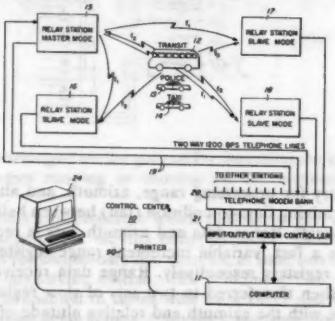


A completely automatic system for monitoring auto racers or the like. Each vehicle carries a transponder which senses its own passage of a position event such as crossing the start-finish line, entering or leaving the pit area, etc., and transmits a signal indicating same to a track side receiver adjacent that event position on a time shared basis with the transponders of all other vehicles. A master transmitter sends a time divisible sync signal to all of the vehicle transponders and each transponder is adapted to transmit a position event signal during only a predetermined time division of the sync signal. Thr track side receivers feed into a central control unit which is also synchronized with the master transmitter and logs the appearance of its positional event of each vehicle in real time. A clock and a computer are provided so that racing rank, lap speeds, etc., may be determined from the log data. A unique position event occurrence sensing system is also disclosed in which an inductance carried by the vehicle passes through a fluctuating magnetic field, the polarity orientation of which defines the position of the particular event.

3,714,650
VEHICLE COMMAND AND CONTROL SYSTEM

Roger L. Fuller, Stow; Sven G. Gustafsson, Framingham; Derek V. Harris, Acton; Robert K. Kaye, Framingham, and Joseph J. Oliver, Allston, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed July 30, 1970, Ser. No. 59,504
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 LC **24 Claims**

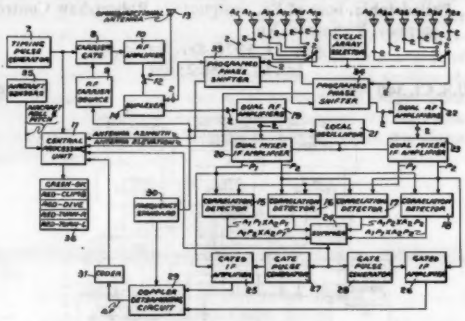


A dual frequency ranging and communication system for communicating with and locating mobile vehicles in a multipath environment such as an urban center. This system functions in urban areas for both communication and ranging where line of sight radiation techniques may not properly function. A plurality of remote relay stations are located at points throughout the urban area, each station receiving and transmitting coded digital data and tone signals, the tone signals being used for phase ranging. Each of the vehicles is equipped with a transponder responsive only to the radio signal having a formatted message including the vehicle identification code with a ranging tone suitably impressed thereon. The formatted signal is transmitted from one of the relay stations at a first frequency and picked up by a preselected number of other relay stations as well as by the vehicle transponder. The vehicle transponder in turn generates a reply signal at a second frequency containing message data and a tone signal modulated on the second frequency for use in ranging, all of which signals are processed at a central location.

3,714,651
NON-COOPERATIVE COLLISION AVOIDANCE SYSTEM

Zeno G. Lyon, Scotch Plains, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 14, 1970, Ser. No. 63,876
Int. Cl. G08g 5/04
U.S. Cl. 343—9 **18 Claims**

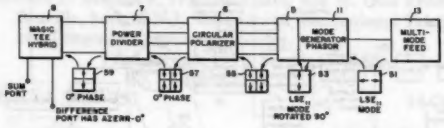


A plurality of main antenna arrays are judiciously disposed on a first aircraft to provide complete coverage of all directions a second aircraft may approach the first aircraft on a collision course. Each of the main arrays includes a pair of orthogonal line arrays. Each of the line arrays includes a plurality of pairs of orthogonal linearly polarized antenna elements. A RF pulse is transmitted from an omnidirectional antenna or from one of the line arrays of a selected main array by the antenna elements having one of the linear polarizations. Correlation detectors are coupled to both line arrays of a selected main array and are responsive to both linear polarizations of both line arrays. A summing circuit is coupled to the correlation detectors to produce a first output signal when the reflected energy of the transmitted RF pulse occurs at intersection of the beams of the first and second line arrays of the selected main array. One of the inputs to the correlation detectors is gated by the first output signal and mixed with a reference frequency signal to produce a second output signal representative of the Doppler frequency of the reflected RF signal. The first and second output signals together with the time of transmitting the RF pulse, the roll and pitch information of the aircraft sensors and the main array elevation and azimuth information are processed and provides an indication of whether the second aircraft is on a collision course with the first aircraft and, in turn, provides an indication of a pre-arranged evasive action for a pilot of the first aircraft to avoid collision with the second aircraft when a collision course is indicated. Each of the main arrays are selected in sequence for coupling to the correlation detectors and while selected the line arrays are steered electronically to provide scanning of an area in the direction the selected main array is radiating.

3,714,652
SINGLE ERROR CHANNEL MONOPULSE SYSTEM

Joseph P. Grabowski, Willingboro, and Walter E. Powell, Jr., Cinnaminson, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 19, 1971, Ser. No. 134,969
Int. Cl. G01s 9/22
U.S. Cl. 343—16 22 Claims

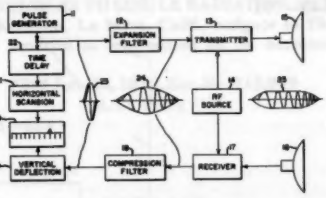


This is a monopulse system for deriving the azimuth and elevation error signals in a single channel, eliminating the second error channel used in the conventional monopulse systems and reducing the number of channels required for the sum azimuth and elevation error signals from three to two channels. This reduction from three to two channels is accomplished by introducing a mode generator in the throat of the feed horn. The mode generator selectively changes the phase of signals in certain modes while leaving the phases of other modes uneffected. These selected signals are processed through a circular polarizer which introduces a time phase delay to the signals unaffected by the mode generator so that in the single error channel two signals appear, the azimuth and the elevation error signals, with the elevation error delayed 90° in relation to the azimuth error. These signals are in phase quadrature, can be processed by basic phase comparison techniques and the azimuth and elevation and error information can be separately extracted.

3,714,653
RADAR SYSTEM

Robert C. Thor, Liverpool, N.Y., and Earl R. Wingrove, Jr., Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Continuation of Ser. No. 706,048, Dec. 20, 1957, abandoned. This application Oct. 15, 1970, Ser. No. 80,897
Int. Cl. G01s 7/28, 9/233
U.S. Cl. 343—17.2 PC 5 Claims

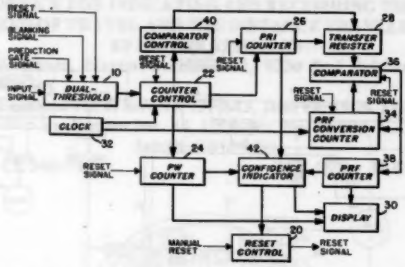


The present invention deals with a multiple stage pulse modifying filter having a time delay characteristic which is a function of frequency over a prescribed band of frequencies and a radar system which incorporates this filter. The filter is first used in extending the duration of transmitted pulses. After reception of echoes of the transmitted pulses and inversion of the frequency spectrum, the same filter is used to shorten the duration of the received pulses. Each stage of the filter, save for the first, consists of a time delay element connected in series with a bandpass filter, the first stage having a bandpass filter, the respective input and output terminals of each subsequent stage being coupled to the respective input and output terminals of the bandpass filter of the preceding stage.

3,714,654
ECM PULSE ANALYZER

Steven A. Wicks, and Robert W. Jones, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Jan. 6, 1972, Ser. No. 215,806
Int. Cl. G01s 7/30, 7/36
U.S. Cl. 343—18 E 2 Claims

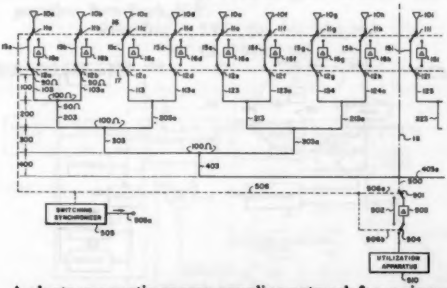


ECM pulse analyzer apparatus for automatically measuring pulse repetition frequency (PRF) and pulsewidth (PW) of incoming pulsed signals received by ECM receivers. Pulsewidth is measured by dual-threshold circuitry which eliminates noise effects by means of a high threshold level which sorts pulses for minimum amplitude and a lower threshold level at which pulsewidth is measured when a pulse exceeds the higher threshold. Pulse repetition frequency is measured by counting PRI during the two periods between the three pulses and converting PRI into PRF by counting up to the stored PRI value at a known rate in a predetermined time period whereby the number of times that the count can proceed is equal to the PRF corresponding to the stored PRI.

3,714,655
ARRAY ANTENNA SIGNAL PROCESSING SYSTEM

Gerald F. Ross, Lexington, Mass., and Leon Susman, Sudbury, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 30, 1970, Ser. No. 76,937
Int. Cl. H01q 3/26
U.S. Cl 343—100 R 6 Claims

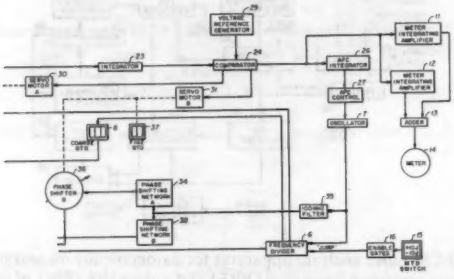


A electromagnetic energy coupling network for reciprocally processing or combining electromagnetic energy flowing in pluralities of transmission lines is disclosed. The coupling element is a multiple port transmission line junction associated with tapered transmission lines and efficiency transferring energy inputs on such lines into a wave flowing only from a single output port. The network may be employed individually or in multiple quantities as an element in complex coupling tree network matrices for the processing of individual impulse signals received by the elements of an antenna array. In application in such signal combining tree matrices, means are provided in the matrix depending upon inherent properties of the coupling element for degrading the adverse effects of internally generated spurious signals.

3,714,656
DIGITAL SIGNAL PROCESSOR FOR USE IN A HYPERBOLIC RADIO NAVIGATION RECEIVER

James I. Meranda, Stony Brook, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 23, 1970, Ser. No. 57,665
Int. Cl. G01s 1/24
U.S. Cl. 343—103 10 Claims

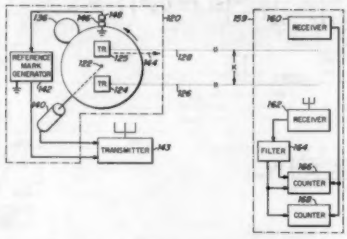


A compact digital apparatus including a first stage limiter in which received rf navigation signals including Loran C or Loran D pulse groups are limited to a fixed amplitude, a digital gate circuit for sampling the limited signals, a first stage of integration for compressing the samples taken on the received signals into multi-level pulses, a second stage limiter having a variable reference level to which the multi-level pulses are compared and limited in magnitude and a second stage of integration to obtain an automatic frequency control signal in addition to a time difference indication from information contained in the received rf navigation signals.

3,714,657
METHOD AND APPARATUS FOR POSITION LOCATION USING ANGLE ENCODING

James M. Lapeyre, New Orleans, La., assignor to Laitram Corporation, New Orleans, La.

Filed June 25, 1970, Ser. No. 49,784
Int. Cl. G01s 1/54
U.S. Cl. 343—106 R 8 Claims

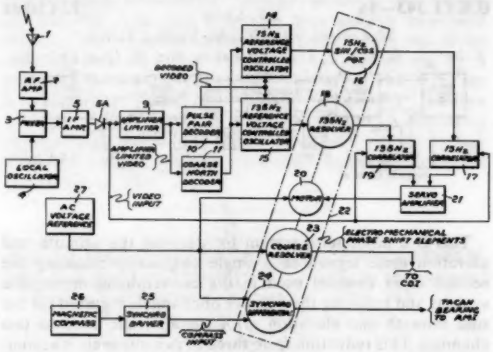


A method and apparatus for providing a position location based on transmission of substantially parallel, collimated, coherent signal beams from a reference position, the beams being rotated in fixed parallel relation to one another about the reference position. The determination of the distance of the receiving position from the reference position, or the determination of the azimuth of the receiving position from a predetermined reference direction through the reference position, or both, is determined according to incremental angular rotation of the beams independently of the angular velocity of rotation.

3,714,658
ANALOG BEARING MEASURING SYSTEM

Ralph L. Asher, Old Tappan, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 14, 1970, Ser. No. 63,794
Int. Cl. G01s 1/46
U.S. Cl. 343—106 R 10 Claims

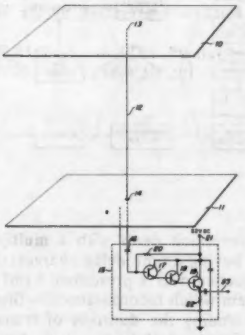


The system described is a closed loop analog system which determines its bearing to a Tacan beacon. The beacon transmits a complex signal including pulse pairs amplitude modulated by fundamental and harmonic waves and spaced main and auxiliary reference pulse groups. The bearing is determined by phase locking two voltage controlled oscillators to the main reference pulse group to provide two reference signals, one having a frequency equal to the frequency of the fundamental wave and the other having a frequency equal to the frequency of the harmonic wave. These reference signals are then correlated with the fundamental and harmonic waves of the complex signal with the resultant phase error signals controlling a motor which is mechanically coupled to phase shift elements to control the phase of the reference signals. A synchro is also coupled mechanically to the motor to provide the bearing when the phase error signals are reduced to zero.

3,714,659
VERY LOW FREQUENCY SUBMINIATURE ACTIVE ANTENNA

Carl M. Firman, 6222 Madeline St., San Diego, Calif.

Filed Dec. 10, 1968, Ser. No. 782,591
Int. Cl. H01q 1/26, 1/48
U.S. Cl. 343—701 7 Claims



A subminiature active antenna includes two non-magnetic conductive plane elements in spaced parallel relationship separated by a distance of the order of the principal dimension of the plane elements. A conductive member connected to a first plane element, extends at right angles through the second plane element, and is connected to a capacitance multiplier circuit grounded to the second plane member. The

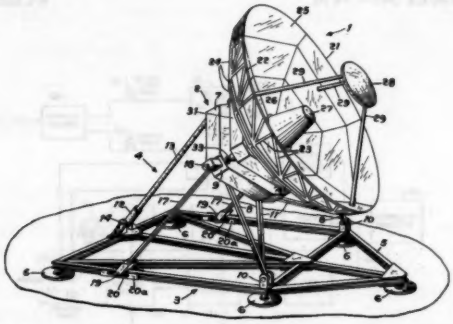
capacitance multiplier circuit has an input impedance of phase and amplitude substantially matching the conjugate aggregate impedance presented to it by the antenna members which are thus caused to appear to a received wave field as a much larger capacitance and consequently develop a greater useful signal.

3,714,660

ANTENNA MOUNTING STRUCTURE

Robert L. Scrafford, Franklin Lakes, and M. Otto Erdmann, Denville, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 23, 1970, Ser. No. 57,660
Int. Cl. H01q 1/10, 1/12, 3/08
U.S. Cl. 343—757 **14 Claims**



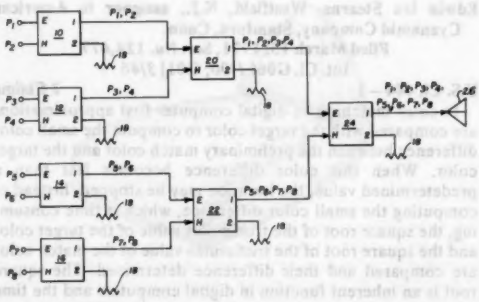
A limited motion antenna mounting structure for use with synchronous satellites. The structure is a modified polar mount constructed of aluminum and steel having the advantage of being rigid, light-weight, of low cost, highly transportable, of simple design, self-erecting and aligned without use of special tools, equipment or techniques. The structure includes a base assembly, an antenna supporting assembly pivotably secured to the base assembly and adjustably secured to the antenna assembly to enable hour angle fine adjustment of the antenna assembly and a hydraulic jack or electric motor driven worm gear to perform the combined functions of self-erection and elevation angle adjustment pivotably secured to the base assembly and the supporting assembly.

3,714,661

METHOD AND APPARATUS FOR COUPLING MULTIPLE POWER SOURCES TO SINGLE RADIATING ANTENNA

Joseph E. Kershaw, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 24, 1972, Ser. No. 219,999
Int. Cl. H01q 1/50
U.S. Cl. 343—858 **2 Claims**



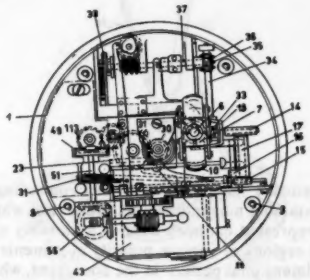
A single antenna can be used to radiate power from multiple power sources having a wide, composite frequency band. Frequency-related pairs of the sources are combined in input hybrid junction devices. The combined outputs thereof are re-combined in successive hybrid junctions. The re-combined outputs are combined a last time in an output hybrid junction to produce a wide band output.

3,714,662

DEVICE FOR INDICATING AND RECORDING THE SPEED OF TRAVEL AND THE DISTANCE TRAVELLED BY MOTOR VEHICLES

Alfons Bauer, Maximiliansstrasse 2, 8230 Bad Reichenhall, Germany

Continuation of Ser. No. 735,643, June 10, 1968. This application Dec. 14, 1970, Ser. No. 97,994
Int. Cl. G01d 9/00
U.S. Cl. 346—18 **10 Claims**



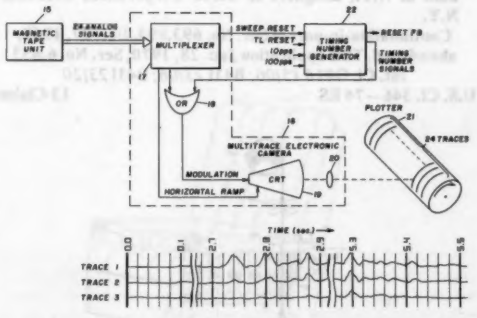
A device for indicating and recording the speed of a vehicle and its distance of travel, comprising a casing housing having indicating and recording means therein. The indicating and recording means comprise a recording tape roller having a recording tape wound thereon, a transporting cylinder and a winding spool for the recording tape with all of the parts being joined to a block designed as a casset, which can be removably disposed in the casing means. The casing is coupled with transporting means having clock work means for step-wise feed motion of the recording tape and time steps.

3,714,663

TIMING NUMBER GENERATOR

Clarence G. Smith, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 9, 1971, Ser. No. 206,408
Int. Cl. G01d 1/00
U.S. Cl. 346—23 **6 Claims**



Multiplexed seismic data representing a plurality of seismic channels intensity modulates each sweep of the electron beam on a cathode-ray tube. Each successive sweep of the electron beam is photographically reproduced on a rotating drum plotter to provide a plurality of seismic traces. Timing lines are recorded at fixed time intervals along the length of the seismic traces as they are recorded on the drum plotter. A generator

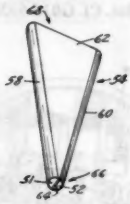
provides timing number signals for selected timing lines to intensity modulate the electron beam on the cathode-ray tube so that timing numbers are photographically reproduced adjacent the selected timing lines.

3,714,664

MAGNETICALLY ENCODED DOCUMENT

Richard E. Fayling, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1970, Ser. No. 88,621
Int. Cl. G06k *15/18*; G11b *5/02, 5/12*
U.S. Cl. 346—74 M **10 Claims**



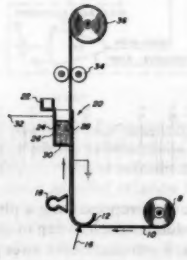
A magnetically encoded document including a broad stratum containing magnetically hard material which is magnetized to represent encoded data as a plurality of disparate magnetized regions of various polarity alignments defining a fixed two-dimensional pattern in the document, wherein upon at least one broad surface of the stratum each magnetized region has magnetized sections of opposite polarities having a narrow boundary therebetween, wherein the angles to which the boundaries extend breadthwise in the stratum of the document represent encoded data, with any given angle being unique to certain data. The document may be magnetically encoded by contacting the document with a pair of oppositely magnetized pole piece faces of a magnetizer key, which magnetizer key includes a tapered permanent magnet and two pole pieces disposed on opposite polarity sides of the permanent magnet, with the pole piece faces being separated by a narrow gap adjacent the narrow end of the permanent magnet.

3,714,665

ELECTROSTATIC RECORDING WITH IMPROVED ELECTROSTATIC CHARGE RETENTION

Edward C. Mutschler, Pittsford, and Uldis Klavsons, Fairport, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 693,893, Dec. 27, 1967, abandoned. This application Jan. 28, 1970, Ser. No. 6,633
Int. Cl. G01d *15/06*; B41f *23/06*; B41l *23/20*
U.S. Cl. 346—74 ES **13 Claims**



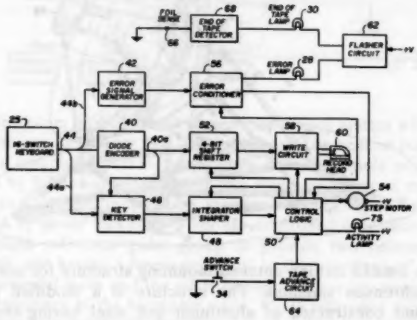
Method and apparatus for electrostatic recording on ordinary paper. An electrostatic latent charge pattern to be developed is deposited on dry ordinary paper. A conductive member is positioned in contact with the other surface of the paper from the point of charge deposition to the development area. The electrostatic latent charge pattern is then developed in the development area.

3,714,666

PORTABLE MAGNETIC TAPE RECORDER HAVING ELECTRONIC ERROR DETECTING MEANS

William R. Guidi, Crest Road, Huntington, N.Y.

Filed Dec. 18, 1970, Ser. No. 99,610
Int. Cl. G11b *15/04, 23/08*
U.S. Cl. 346—74 M **8 Claims**



A portable recording device for recording data on magnetic tape which has manually operated make and break contact key switches. A transistorized detector circuit responds to a keying error constituting simultaneous operation of more than one key switch to actuate an error signal. The error condition prevents recording of any data until cleared by selective key operation. Integrated logic circuit means prevents storing and recording of data until spurious pulses generated by making and breaking key switch contacts are suppressed. A write circuit and dual recording head record data on two tracks simultaneously. An end of tape detector, a manually controlled advance circuit for the tape drive step motor, and an automatically actuated signal of low battery voltage are also provided.

3,714,667

EVALUATION OF MATCHES IN COMPUTER COLOR MATCHING

Edwin Ira Stearns, Westfield, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed March 15, 1971, Ser. No. 124,477
Int. Cl. G06f *1/00*; G01j *3/46*
U.S. Cl. 444—1 **2 Claims**

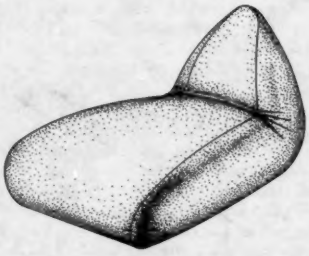
In color matching by digital computer first approximations are compared with the target color to compute the small color difference between the preliminary match color and the target color. When this color difference becomes less than a predetermined value, the iteration may be stopped. Instead of computing the small color difference, which is time consuming, the square root of the tristimulus value of the target color and the square root of the tristimulus value of the match color are compared and their difference determined. The square root is an inherent function in digital computers and the time taken is very slight. However, the square root differences are approximately as accurate as the more time consuming Adams chromatic value color difference.

DESIGNS

JANUARY 30, 1973

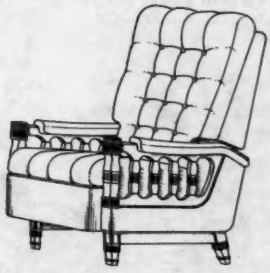
226,152
PORTABLE LAWN STAND FOR A TUMBER OR THE LIKE
Maurice H. Dowding, 8950 Narrow Lake Road, Springport, Mich. 49284
Filed Mar. 15, 1971, Ser. No. 124,625
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—20

226,153
LEGLESS LOUNGE CHAIR
James E. Boak, 529 E. University St., Rochester, Mich. 48063
Filed May 3, 1971, Ser. No. 140,012
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—37

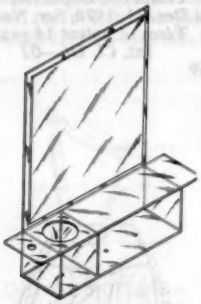


226,154
ARMCHAIR
Vittorio Introini, Gallarate, Italy, assignor to Proposals S.r.L., via Postporta, Gallarate, Varese, Italy
Filed Dec. 21, 1970, Ser. No. 26,604
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—69

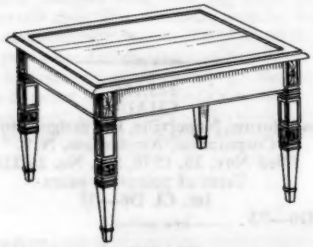
226,155
CHAIR
Thomas Winrow, Naperville, Ill., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Nov. 30, 1970, Ser. No. 26,220
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—73



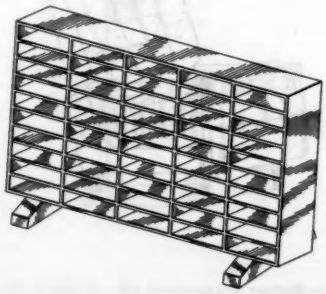
226,156
COMBINED MIRROR AND BATHROOM ACCESSORIES HOLDER
James A. Fitzgibbon, 1518 Blue Road, Coral Gables, Fla. 33146
Filed June 1, 1971, Ser. No. 149,130
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—91



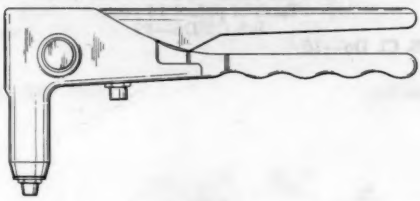
226,157
TABLE
Thomas Winrow, 530 S. Sleight St., Naperville, Ill. 60540
Filed Dec. 7, 1970, Ser. No. 26,321
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



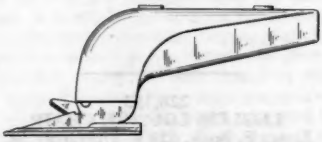
226,158
DISPLAY RACK FOR TAPE CARTRIDGES
Ralph C. Bertanzetti, 4522 Nantucket Blvd., Youngstown, Ohio 44515
Filed Apr. 20, 1971, Ser. No. 135,826
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—190



226,159
RIVET SETTING TOOL OR SIMILAR ARTICLE
Anthony E. Di Maio, Georgetown, Mass., assignor to Marson Corporation, Chelsea, Mass.
Filed Apr. 19, 1971, Ser. No. 135,296
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



226,160
ELECTRIC SCISSORS
E. Giorgio Laurenti, New York, N.Y., assignor to Lindar Mfg. Corporation, New York, N.Y.
Filed May 7, 1971, Ser. No. 141,459
Term of patent 7 years
Int. Cl. D8—*03*
U.S. Cl. D8—61



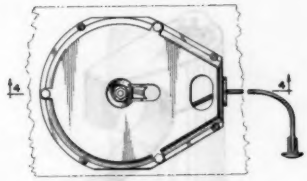
226,161
DOOR LOCK OPERATOR
Harry A. Paulsen, 107 W. 85th St., Kansas City, Mo. 64114
Filed June 21, 1971, Ser. No. 155,399
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—88

226,162
FIREMAN'S TOOL
Theodore Ziaylek, Jr., 140 Riverview Ave., Yardley, Pa.
Filed Apr. 21, 1971, Ser. No. 136,287
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—81

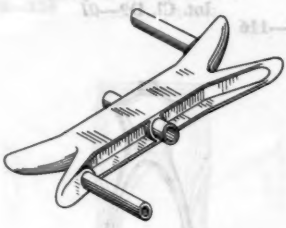
226,163
LOCK
Ralph Lyle Denny, 4820 Kyser Road, Lowell, Mich. 49331
Filed July 14, 1971, Ser. No. 162,760
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—131

226,164
ORNAMENTAL WING STRAP FOR USE WITH HINGES
David F. James, Redondo Beach, Calif., assignor to Hyer Hardware Mfg. Co., Anaheim, Calif.
Filed Sept. 10, 1971, Ser. No. 179,605
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—179

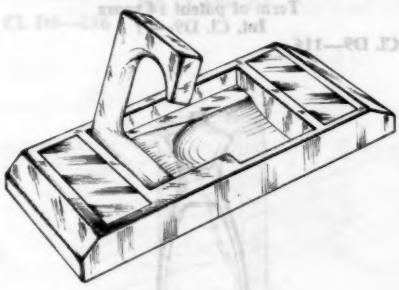
226,165
SELF-REWINDING REEL UNIT FOR ROPE
Albert E. Miller, 413 E. Locust St., Lodi, Calif. 95240
Filed June 16, 1971, Ser. No. 153,920
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—220



226,166
REEL FOR STRING
Jerry A. Brinkman, 635 Alameda Place, Dayton, Ohio 45405
Filed Apr. 19, 1971, Ser. No. 135,535
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D8—222



226,167
RETRACTABLE ROPE HOOK FOR VEHICLES
Irvin C. Del Ponte, 272 N. 18th St., San Jose, Calif. 95112
Filed May 14, 1971, Ser. No. 143,748
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—232

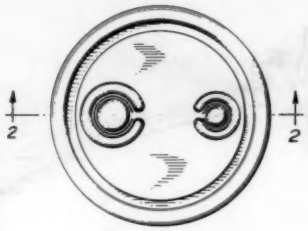


226,168
COMBINED BOTTLE AND CAP THEREFOR
Ralph A. Muscatiello, Norwood, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Oct. 14, 1971, Ser. No. 189,492
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71

226,169
BOTTLE
John J. Bielicki, Wilmington, and Raymond H. Davis, Newark, Del., assignors to American Can Company, Greenwich, Conn.
Filed July 1, 1971, Ser. No. 159,098
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116

226,170
BOTTLE
Raymond H. Davis, Newark, and John J. Bielicki, Wilmington, Del., John C. Murphy, West Redding, Conn., and George P. Ziehmer, Yonkers, N.Y., assignors to American Can Company, Greenwich, Conn.
Filed July 1, 1971, Ser. No. 159,099
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116

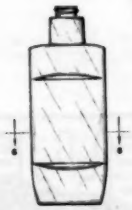
226,171
CONTAINER END
Henry Sylvester Holc, Barrington, and Harlen Edgar Wilkinson, Crystal Lake, Ill., assignors to American Can Company, Greenwich, Conn.
Filed Oct. 7, 1971, Ser. No. 187,585
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—253



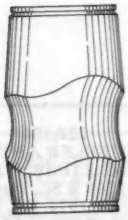
226,172
CONTAINER LID
Howell T. McElvy, Decatur, and Gene D. MacDaniel, Lithonia, Ga., assignors to Sweetheart Plastics, Inc., Conyers, Ga.
Filed June 7, 1971, Ser. No. 150,892
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254

226,173
ADAPTER FOR MOUNTING LIMBS ON ARTIFICIAL TREES
Terry Hermanson, New York, N.Y., assignor to Mr. Christmas Incorporated, New York, N.Y.
Filed Apr. 6, 1971, Ser. No. 131,851
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—255

226,174
BOTTLE
John R. Osborn, New York, N.Y., assignor to National Distillers and Chemical Corporation, New York, N.Y.
Filed June 28, 1971, Ser. No. 157,809
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—44

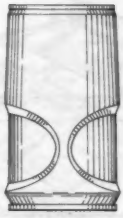


226,175
CAN OR SIMILAR ARTICLE
Dexter M. Bystedt, Clarendon Hills, and Thomas R. Stanley, Downers Grove, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Dec. 10, 1971, Ser. No. 206,762
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

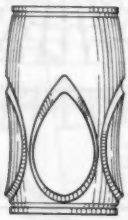


226,176
CAN OR SIMILAR ARTICLE
Dexter M. Bystedt, Clarendon Hills, and Thomas R. Stanley, Downers Grove, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Dec. 10, 1971, Ser. No. 206,766
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

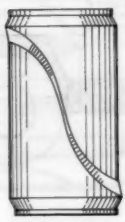
226,177
CAN OR SIMILAR ARTICLE
Dexter M. Bystedt, Clarendon Hills, and Thomas R. Stanley, Downers Grove, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Dec. 10, 1971, Ser. No. 206,767
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



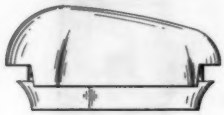
226,178
CAN OR SIMILAR ARTICLE
Dexter M. Bystedt, Clarendon Hills, and Thomas R. Stanley, Downers Grove, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Dec. 10, 1971, Ser. No. 206,987
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



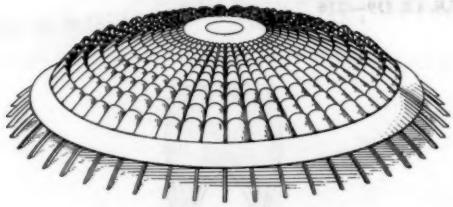
226,179
CAN OR SIMILAR ARTICLE
Dexter M. Bystedt, Clarendon Hills, and Thomas R. Stanley, Downers Grove, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed Dec. 10, 1971, Ser. No. 206,988
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



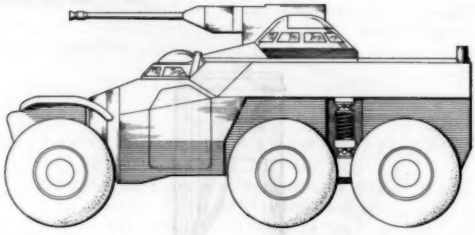
226,180
CAN RESEALING CLOSURE
Robert Sidney Lutzker, 90—12 212th St., Queens Village, N.Y. 11428
Filed Nov. 10, 1971, Ser. No. 197,637
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



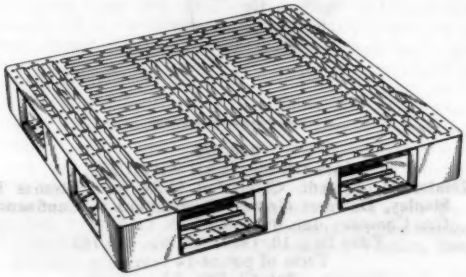
226,181
STADIUM ROOF
Alexander G. Tarics, Belvedere, Calif. (1019 Market St., San Francisco, Calif. 94103)
Filed Dec. 28, 1970, Ser. No. 26,674
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 R



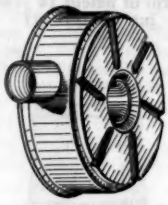
226,182
ARTICULATED ARMORED VEHICLE
Thomas R. Danielson, Sunnyvale, David R. Fleming, Campbell, and Frederick Sturner, Sunnyvale, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.
Filed Mar. 10, 1971, Ser. No. 123,129
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D14—3 R



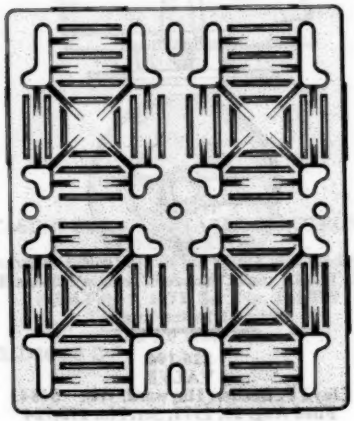
226,183
PALLET FOR TRANSPORTATION
Mituru Fujii, Urawa, and Izumi Narusawa, Tokyo, Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan
Filed June 21, 1971, Ser. No. 155,403
Claims priority, application Japan Dec. 21, 1970
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3 N



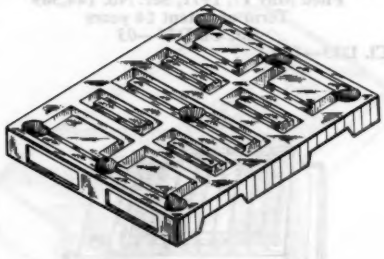
226,184
COMBINATION MUFFLER AND SPARK ARRESTER FOR INTERNAL COMBUSTION ENGINES
Paul S. Moller, 1308 B St., Davis, Calif. 95616
Filed June 30, 1971, Ser. No. 158,663
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6 D



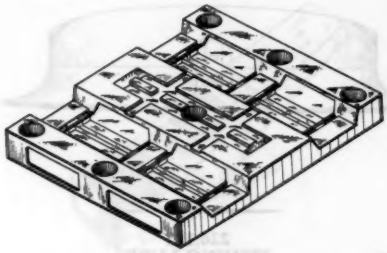
226,185
PALLET
James R. Freund, Roslyn, Pa., assignor to Pennsylvania Pacific Corporation, Warminster, Pa.
Filed Nov. 29, 1971, Ser. No. 203,118
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3 N



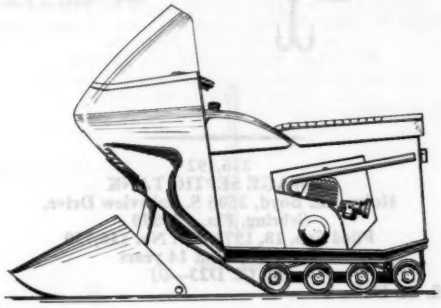
226,186
PALLET
Dennis M. Melnick and Mark Kublick, Baden, Pa., assignors to Pallet Development Inc., Ambridge, Pa.
Filed Jan. 17, 1972, Ser. No. 218,636
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3



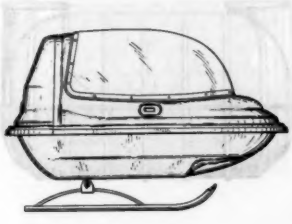
226,187
PALLET
Dennis M. Melnick and Mark Kubick, Baden, Pa., assignors to Pallet Development Inc., Ambridge, Pa.
Filed Feb. 2, 1972, Ser. No. 223,049
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3



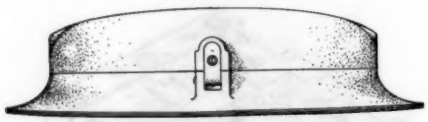
226,188
SNOWMOBILE
Richard G. Reed, 22656 Nona, Dearborn, Mich. 48124
Filed Jan. 18, 1971, Ser. No. 107,607
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—24



226,189
SLEIGH
Jules Marois, Neufchatel, Quebec, Canada, assignor to Aurele Maroio Inc., Montmagny, Quebec, Canada
Filed July 6, 1971, Ser. No. 160,271
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—24

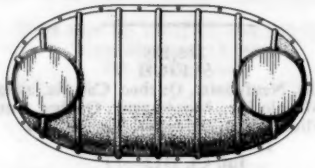


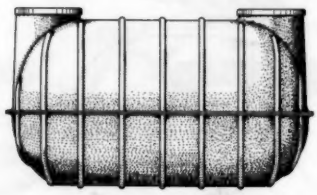
226,190
SPARE TIRE CARRIER
Paul A. Diforte, 2615 Pelham Ave., Baltimore, Md. 21213
Filed June 11, 1971, Ser. No. 152,473
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—30



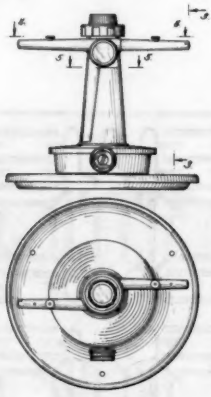
226,191
FISHING LURE
Richard M. Hanna, 8178 Golena St., Riverside, Calif. 92509
Filed Aug. 27, 1971, Ser. No. 175,799
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

226,192
SEWAGE SEPTIC TANK
Holmes E. Boyd, 2506 S. Lakeview Drive, Sebring, Fla. 33870
Filed Feb. 18, 1971, Ser. No. 116,730
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2

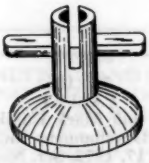




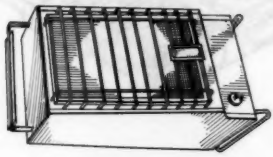
226,193
LAWN SPRINKLER
Douglas W. Anderson, Palatine, Ill., assignor to Burgess Vibrocrafters, Inc., Grayslake, Ill.
Filed Feb. 8, 1971, Ser. No. 113,800
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



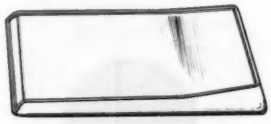
226,194
VALVE
Lloyd F. Bender, Hayward, Wis. 54843
Filed Aug. 20, 1971, Ser. No. 173,724
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



226,195
HEATER
Benjamin C. Baugh, Robert R. Deines, and Floyd O. Gruver, Jr., Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.
Filed May 17, 1971, Ser. No. 144,369
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—124



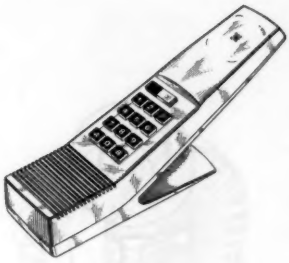
226,196
CASING FOR A PORTABLE ELECTRONIC CALCULATOR
Edward T. Liljenwall, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 1, 1971, Ser. No. 111,789
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



226,197
CASING FOR A PORTABLE ELECTRONIC CALCULATOR
Edward T. Liljenwall, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 1, 1971, Ser. No. 111,799
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

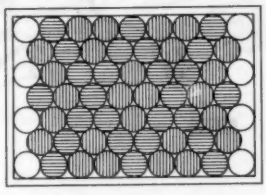
226,198
VIDEO SIGNAL GENERATING KEYBOARD
William L. King, Wheaton, Md., assignor to Datavision, Inc.
Filed Mar. 30, 1971, Ser. No. 129,660
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

226,199
TELEPHONE INSTRUMENT
Carl-Arne Breger, Malmo, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Mar. 31, 1971, Ser. No. 130,063
Claims priority, application Sweden Oct. 1, 1970
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



226,200
STANCHION
Aaron I. Friedman, Kentfield, Calif.
(325 Minna St., San Francisco, Calif. 94103)
Filed Feb. 8, 1971, Ser. No. 113,813
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D28—1 C

226,201
GAMEBOARD
Robert A. Ward and Billy Ray Ward, both of Rte. 3, Union City, Tenn. 38261
Filed Mar. 11, 1971, Ser. No. 123,483
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



226,202
INTERCHANGEABLE CHESS PIECE
Anthony Victor Rossi, 224 South Drive, Blackwood, N.J. 08012
Filed Apr. 21, 1971, Ser. No. 136,286
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH

226,203
GOLF CLUB WITH AUXILIARY FIXTURES
Dwight W. Gibbs and Raymond R. Carter, Tucson, Ariz., assignors to C. G. Originals
Filed Apr. 26, 1971, Ser. No. 137,738
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

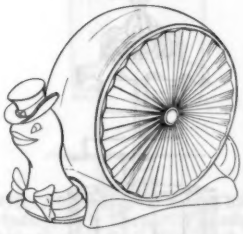
226,204
GOLF CLUB PUTTER
Frank John Indovina, 5266 Oak Park Ave., Encino, Calif. 91316
Filed June 14, 1971, Ser. No. 153,154
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

226,205
CUE STICK
Julian A. Carreiro, Santa Susanna, Calif., assignor of a fractional part interest to Angelo N. Giordano, Canoga Park, Calif.
Filed June 23, 1971, Ser. No. 156,163
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BL

226,206
PADDLE
Vance O. Rankin, Jr., and George A. Howell, Atlanta, Ga., assignors to Bo-Lo Company, Atlanta, Ga.
Filed June 25, 1971, Ser. No. 157,086
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

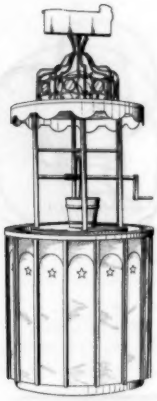
226,207
TELESCOPING CUE STICK
Julian A. Carreiro, Santa Susanna, Calif., assignor of a fractional part interest to Angelo N. Giordano, Canoga Park, Calif.
Filed July 2, 1971, Ser. No. 159,153
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BL

226,208
ANIMAL FIGURE TOY
Michael R. Meyers, Monsey, N.Y., and Michael Langieri, Little Falls, N.J., assignors to Questor Corporation, Toledo, Ohio
Filed June 3, 1971, Ser. No. 115,914
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



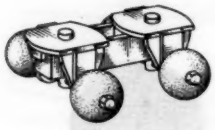
226,209
BARN TOY
Robert I. Genin, Scarsdale, N.Y., assignor to Questor Corporation, Toledo, Ohio
Filed Feb. 22, 1971, Ser. No. 117,873
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL

226,210
FISHING GAME WELL
James Windell Ganus, 463 Topaz St., and Robert Victor Fuchs, 4951 Hauck Drive, both of New Orleans, La.
Filed Apr. 16, 1971, Ser. No. 134,920
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

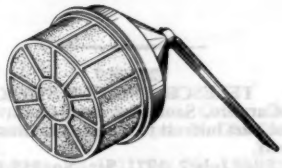


226,211
STYLIZED MODEL TRUCK
Eugene T. Daniel, Walnut, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed June 21, 1971, Ser. No. 154,920
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

226,212
TOY VEHICLE CHASSIS
Carl A. Swenson, 615 N. Berlyn Ave., Ontario, Calif. 91764
Filed July 19, 1971, Ser. No. 164,211
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

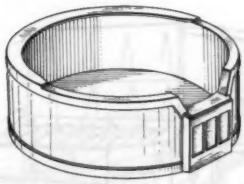


226,213
BOUQUET HOLDER
Gene R. Meyer, P.O. Box 7, Deer Park, N.Y. 11729
Filed May 7, 1971, Ser. No. 141,466
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 R

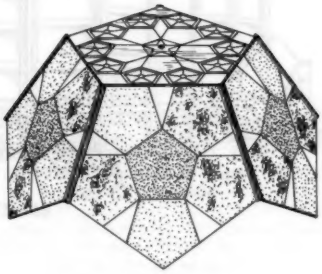


226,214
WATCH DIAL
Ewald Hoffmann, Pforzheim, Germany, assignor to Bock & Schupp, Pforzheim, Germany
Filed July 19, 1971, Ser. No. 164,237
Claims priority, application Germany Jan. 21, 1971
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—1

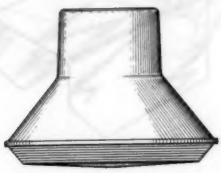
226,215
HOLDER FOR COASTERS
Donald A. Hillis, 1950 Ellesmere Road, Scarborough, Ontario, Canada
Filed Jan. 11, 1971, Ser. No. 105,776
Claims priority, application Canada July 21, 1970
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—10 D



226,216
LAMPSHADE
Macon D. Rice, P.O. Box 1905, Hawthorne, Nev. 89412
Filed Oct. 4, 1971, Ser. No. 186,566
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 E

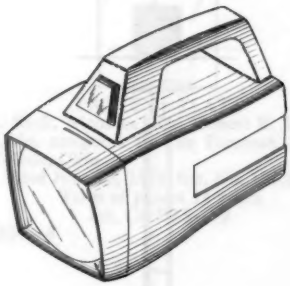


226,217
LUMINAIRE
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to General Electric Company
Filed July 16, 1971, Ser. No. 163,559
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23



226,218
ELECTRIC LAMP CASING
Rene Marcel Angibaud, Vernon, Eure, France, assignor to Societe les Piles Wonder, Saint-Ouen, France
Filed Nov. 1, 1971, Ser. No. 194,801
Claims priority, application France May 25, 1971
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24

226,219
PORTABLE HAND LANTERN
Robert E. Brindley, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Dec. 28, 1971, Ser. No. 213,230
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24



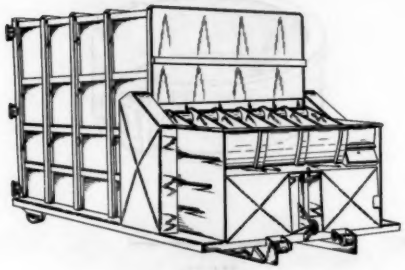
226,220
TABLE LIGHTER
Dieter Rams, Konigstein, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Continuation-in-part of design application Ser. No. 21,803, Mar. 9, 1970. This application July 20, 1971, Ser. No. 164,490
Claims priority, application Germany Sept. 9, 1969
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

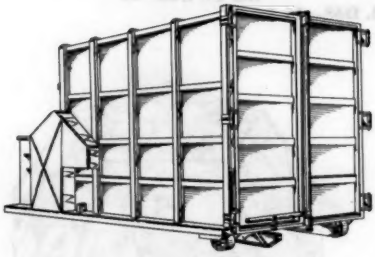
226,221
CIGARETTE LIGHTER
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Taito-ku, Tokyo, Japan
Filed Feb. 8, 1972, Ser. No. 224,648
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

226,222
OUTDOOR LIGHTING FIXTURE
Anthony C. Donato, Westfield, N.J., assignor to Lightolier Incorporated, Jersey City, N.J.
Filed June 30, 1971, Ser. No. 130,062
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

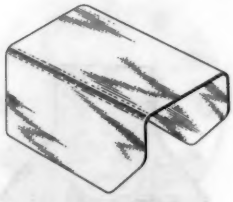
226,223
TRASH CONTAINER
Alfred Udell Nelson and Alder L. Pederson, both of Roseau, Minn. 56751
Filed Jan. 11, 1971, Ser. No. 105,788
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D49—30

226,224
PORTABLE REFUSE CONTAINER WITH UNITARY PACKER
Lewis W. Schmidt, Rio Vista, Calif., assignor to Blackwelder Manufacturing Company, Rio Vista, Calif.
Filed Jan. 27, 1972, Ser. No. 221,485
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—32

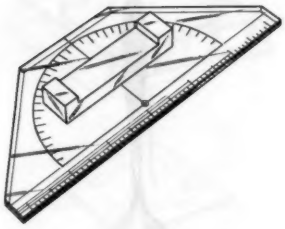




226,225
OUTDOOR CASH BOX-IMPRINTER HOOD
Raymond B. Dawley, 980 Stony Hill Road, and Chester L. Joyce, 1226 Fernside St., both of Redwood City, Calif. 94061
Filed Mar. 17, 1971, Ser. No. 125,456
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D52—4 A



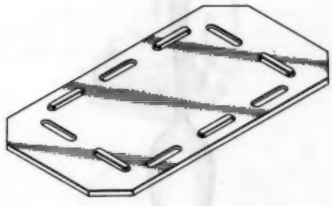
226,226
TRANSPARENT DRAFTING DEVICE HAVING RAISED HANDLE MEANS
Peter S. Hoagland, 18769 Saratoga, Lathrup Village, Mich. 48076
Filed July 6, 1971, Ser. No. 160,234
Term of patent 14 years
Int. Cl. D10—*99*
U.S. Cl. D52—6



226,227
WEIGHING SCALE
Earl D. Myers, Westfield, N.J., and Samuel S. Leotta, Jenkintown, Pa., assignors to Ohaus Scale Corporation
Filed July 1, 1971, Ser. No. 159,077
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—10

226,228
PATTERN PLATE
Gerald R. Rusk, Maumee, and Robert E. Koch, Ottawa Lake, Ohio, assignors to The Freeman Supply Company, Toledo, Ohio
Filed June 28, 1971, Ser. No. 157,274
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D54—8

226,229
PATTERN PLATE
Gerald R. Rusk, Maumee, and Robert E. Koch, Ottawa Lake, Ohio, assignors to The Freeman Supply Company, Toledo, Ohio
Filed June 28, 1971, Ser. No. 157,813
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D54—8



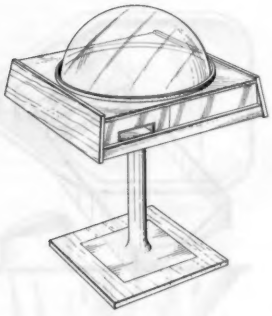
226,230
SPOON OR SIMILAR ARTICLE
Marion Weeber, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Mar. 1, 1971, Ser. No. 120,006
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

226,231
SPOON OR SIMILAR ARTICLE
Marion Weeber, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed June 3, 1971, Ser. No. 149,892
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12 R

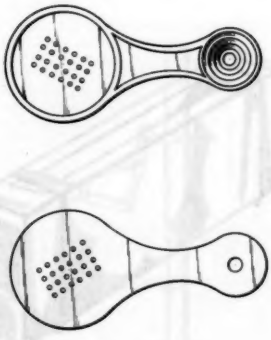
226,232
SPOON OR SIMILAR ARTICLE
Raymond T. Cleeland, Freehold, N.J., assignor to American Home Products Corporation, New York, N.Y.
Filed Aug. 18, 1971, Ser. No. 172,958
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

226,233
COMBINED RECORD PLAYER AND AMPLIFIER OR SIMILAR ARTICLE
Ken Okabe, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan
Filed Apr. 6, 1971, Ser. No. 131,843
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R

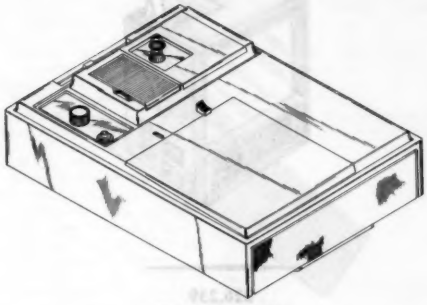
226,234
HOUSING FOR A RADIO-PHONOGRAPH OR SIMILAR ARTICLE
Harvey K. McQuarrie, Kitchener, Ontario, Canada, assignor to Electrohome Limited, Kitchener, Ontario, Canada
Filed June 18, 1971, Ser. No. 154,712
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4



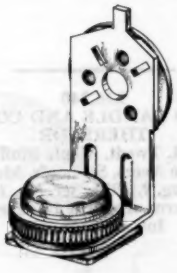
226,235
MULTIPLE PINHOLE MAGNIFIER
Gerald Kessler, 388 Cranberry Road, Youngstown, Ohio 44512
Filed Feb. 22, 1971, Ser. No. 117,864
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1



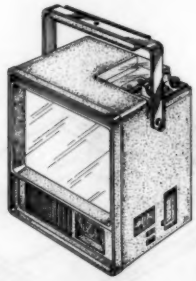
226,236
MOTION PICTURE PROJECTOR OR THE LIKE
Dianne B. Ainslie, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 1, 1971, Ser. No. 119,981
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



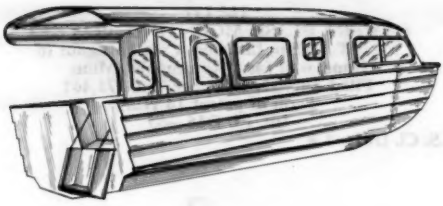
226,237
CAMERA FLASH MOUNTING BRACKET
Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Aug. 12, 1971, Ser. No. 171,407
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 F



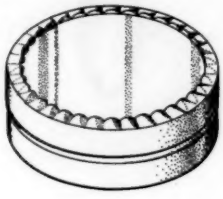
226,238
SLIDE PROJECTOR
Masaaki Furukawa, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed July 6, 1971, Ser. No. 160,230
Claims priority, application Japan Jan. 16, 1971
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



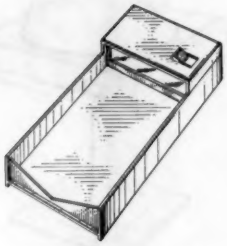
226,239
HOUSE BOAT
William Levi Varner, North Surrey, British Columbia, Canada, assignor to Nahanni Manufacturing Ltd., New Westminster, British Columbia, Canada
Filed May 19, 1971, Ser. No. 145,100
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 V



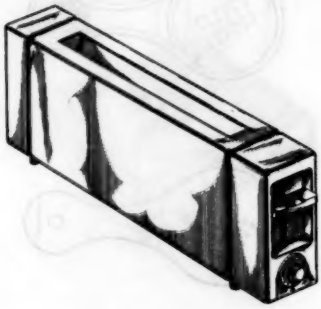
226,240
COMBINED CANDLE AND CONTAINER THEREFOR
Janet R. Twedt, Maple Bluff, Wis.
(33 Bellerive Acres, St. Louis, Mo. 63121)
Filed Aug. 9, 1971, Ser. No. 170,410
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D73—1 B



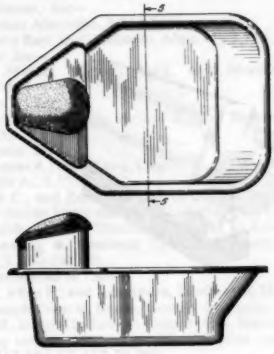
226,241
ILLUMINABLE MEMO PAD HOLDER OR SIMILAR ARTICLE
Harry Zelenko, 150 E. 61st St., New York, N.Y. 10021
Filed Dec. 17, 1971, Ser. No. 209,505
Term of patent 7 years
Int. Cl. D19—*02*
U.S. Cl. D74—1 C



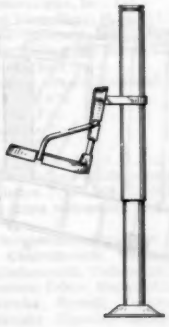
226,242
TOASTER
Reinhold M. Weiss, Chicago, Ill., assignor to The Gillette Company, Boston, Mass.
Filed June 25, 1971, Ser. No. 157,085
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10



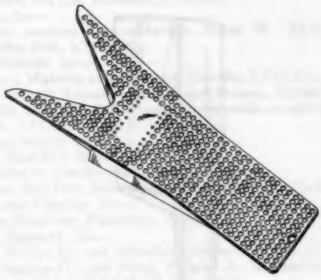
226,243
COMBINED TUB AND WHIRLPOOL CIRCULATOR
Henry J. Talge, Kansas City, and Herbert D. Goldsmith, Independence, Mo., assignors to The Songrand Corporation, Kansas City, Mo.
Filed Jan. 21, 1971, Ser. No. 108,695
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1



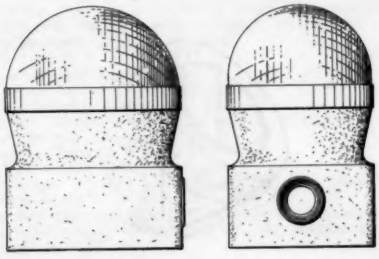
226,244
INVALID BATHING LIFT FOR BATHTUBS OR THE LIKE
Benton H. Grant, Stamford, Conn., and Trevor W. Denzey, Toronto, Ontario, Canada, assignors to Grant Airmass Corporation, Stamford, Conn.
Filed July 20, 1971, Ser. No. 164,493
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1



226,245
BOOTJACK
Maurice M. Cairns, Roseburg, Oreg., assignor to North Pacific Products, Inc., Bend, Oreg.
Filed Feb. 9, 1971, Ser. No. 113,990
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D86—10 D

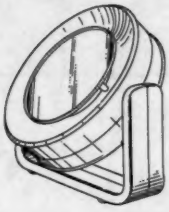


226,246
WIG DRIER
Willard John Duecker, 1041 Cameron Way, Stockton, Calif. 95207, and Don F. Drieschman, Inverness, Calif.; said Drieschman assignor to said Duecker
Filed Apr. 13, 1971, Ser. No. 133,776
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

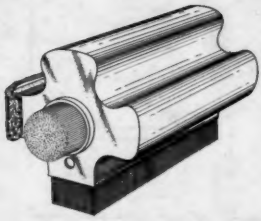


226,247
ELECTRIC HAIR DRYER
Monte L. Levin, New York, N.Y., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Mar. 4, 1971, Ser. No. 121,240
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

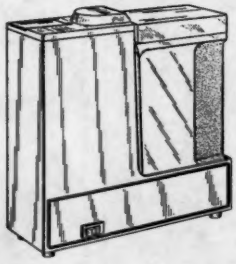
226,248
DOUBLE-SIDED ILLUMINATED MIRROR
Kurt R. Krusche, Frankfurt am Main, Germany, assignor to Allstar Verbrauchsgueter GmbH & Co. K.G., Frankfurt am Main, Germany
Filed May 24, 1971, Ser. No. 146,594
Claims priority, application Germany Nov. 27, 1970
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10



226,249
SHOE CLEANING-POLISHING DEVICE
Andrew W. Brainerd, Kent H. Brainerd, and Stuart W. Brainerd, all of 630 Walden Road, Winnetka, Ill. 60093
Filed Mar. 5, 1971, Ser. No. 121,617
Term of patent 14 years
Int. Cl. D4—*99*
U.S. Cl. D86—11



226,250
COMBINED ICE CRUSHER AND DRINK MIXER APPLIANCE
Norman A. Steinkamp, Chicago Heights, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 11, 1971, Ser. No. 105,769
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D89—1 D



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF JANUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Cheminova: *See—*
Thomsen, Morten, 3,714,301.

AB Cernelle: *See—*
Carlsson, Carl Gosta, 3,713,836.

Abbott Laboratories,: *See—*
Hirata, Arthur Atsunobu, 3,714,345.
Martin, Jerry Roy; and Goldstein, Alma W., 3,714,142.

Abe, Jinnosuke: *See—*
Kitajima, Masao; Kondo, Asaji; and Morishita, Masataka, 3,714,065.

Abeling, Arthur B.: *See—*
Cribbs, John A.; Abeling, Arthur B.; and Breeden, Kenneth H., 3,714,632.

Abex Corporation: *See—*
Eddy, Thomas A.; and White, Charles E., 3,713,686.
Zupez, John A., 3,713,398.

Abler, Norman C.; and Zernov, Peter, to Zerand Corporation. Jogger assembly for carton blank stacker. 3,713,651, Cl. 271-89.000.

Abromavage, John C.; and Shattles, Henry S., to Advanced Management Engineering & Research Co. Chassis with storage space. 3,713,662, Cl. 280-106.00r.

Acampora, Ferdinando M.: *See—*
Rosevear, Allan F.; and Acampora, Ferdinando M., 3,713,909.

Ackerman, Joseph Francis; Beerli, George; Savageau, Robert George; and Weisfeld, Joseph, to Inmont Corporation. Method of printing or coating using actinic radiation setting of applied coating and coated product. 3,713,864, Cl. 117-38.000.

Ackley, Richard H., to PPG Industries, Inc. Composite mat structure. 3,713,962, Cl. 161-154.000.

Acra Electric Corporation: *See—*
Hummel, Matt N., 3,714,395.

Adachi, Syozo; and Ueyama, Masasi, to Iwatsu Electric Company Limited. Electrophotographic liquid developer containing asphalt and modified alkyl resin. 3,714,048, Cl. 252-62.100.

Adair, Edwin Lloyd. Suprapubic shunt. 3,713,447, Cl. 128-347.000.

Adair, James Richard, to Wean United, Inc. Retractable gauge control assembly for a rolling mill. 3,713,314, Cl. 72-19.000.

Adams, Phillip; Petrocci, Alfonso N.; and Merianos, John J., to Millmaster Onyx Corporation. Metal-working fluid containing a 2,4,5-trichloroaniline derivative as a microbiocide. 3,714,046, Cl. 252-51.50r.

Adams, Richard H.: *See—*
Hill, Jacques A. F.; and Adams, Richard H., 3,713,607.

Addressograph-Multigraph Corporation: *See—*
Sargis, John R., 3,713,736.

Adler, Karl-Heinz, to Bosch, Robert, G.m.b.H. Simulator for electronic control circuit in a diesel engine. 3,713,427, Cl. 123-32.0ea.

Adler, Robert; De Vries, Adrian J.; and Dias, Eleming. Demodulator acoustic surface wave device. 3,714,594, Cl. 329-117.000.

Advanced Management Engineering & Research Co.: *See—*
Abromavage, John C.; and Shattles, Henry S., 3,713,662.

AEG-Elotherm GmbH: *See—*
Starck, Axel Von; and Schnake, Friedrich, 3,713,639.

Aerochem Research Laboratories, Inc.: *See—*
Fontijn, Arthur; and Vree, Pieter H., 3,713,773.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Foex, Marc; Delmas, Robert; and Bonet, Claude, 3,714,390.

Agfa-Gevaert Aktiengesellschaft: *See—*
Bestenreiner, Friedrich; Deml, Reinhold; Kubitzek, Alfred; and Borowski, Kurt, 3,714,435.
Krekeler, Ulrich, 3,713,880.

Agricultural Control Systems: *See—*
Simms, R. John, 3,713,743.

Agusta, Benjamin; and Lubart, Eneil D., to International Business Machines Corporation. Method of fabricating lateral transistors and complementary transistors. 3,713,908, Cl. 148-175.000.

Ahrend, Mary E. Solid waste incinerator and process. 3,713,402, Cl. 110-8.00r.

Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, to Bashkirsky Nauchno-Issledovatelsky Institut Po. Method of processing heavy sulfur bearing petroleum residues into low-sulfur motor and boiler plant fuels. 3,714,025, Cl. 208-86.000.

Air-Way Manufacturing Company: *See—*
Jaquette, Robert D., 3,713,199.

Akanuma, Masanobu: *See—*
Takamori, Takeshi; and Akanuma, Masanobu, 3,713,790.

Akazawa, Tsugio. Glass electrode for determining pH value at super high temperatures. 3,713,992, Cl. 204-1.00t.

Akimov, Vladimir Stefanovich: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.

Akin, Cavit: *See—*
Delente, Jacques J.; Lueckerath, Elmer W.; Akin, Cavit; and Krabbe, Erik, 3,713,839.

Akiyama, Hideaki: *See—*
Kurihara, Makoto; and Akiyama, Hideaki, 3,713,371.

Akiyama, Toyomi; Kondo, Mitsuru; and Dotani, Satoshi, to Kanzaki Paper Mfg. Co., Ltd. Paper coating compositions and paper coated therewith. 3,713,881, Cl. 117-155.0ua.

Aktiebolaget Bofors: *See—*
Hjelm, Karl Erik Waldemar, 3,713,389.

Aktieselskabet de Danske Sukkerfabrikker: *See—*
Madsen, Rud Frik; and Jensen, Jens Herman, 3,713,341.

Aktieselskabet Fibertex: *See—*
Lerche-Svendsen, Flemming, 3,713,931.

Albertassi, James H.: *See—*
Tufts, Wesley M.; and Albertassi, James H., 3,713,177.

Albrecht, George O.; and Nead, Thomas E., to Cincinnati Milacron Inc. Velocimeter. 3,714,538, Cl. 321-1.000.

Albright & Wilson Limited: *See—*
Rockey, Kenneth William, 3,714,291.

Alburn, Harvey E.; and Fletcher, Horace, III, to American Home Products Corporation. Cyclopentene derivatives. 3,714,248, Cl. 260-557.00r.

Alcan Research and Development Limited: *See—*
Bryson, Neil Burton, 3,713,479.

Alfa Romeo S.p.A.: *See—*
Satta, Orazio, 3,713,425.

Alferov, Jury Fedorovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Baglai, Vitaly Mikhailovich; and Alferov, Jury Fedorovich, 3,713,476.

Allegheny Ludlum Industries, Inc.: *See—*
Reen, Orville W., 3,713,817.
Zaremski, Donald R., 3,713,903.

Alling, Richard L.; and Iffland, Roger L., to Torrington Company, The. Lanced tab race. 3,713,713, Cl. 308-235.000.

Allington, Robert W., to Instrumentation Specialties Company. Baseline correction circuit. 3,714,591, Cl. 328-162.000.

Allis-Chalmers Manufacturing Company: *See—*
Codlin, James B., 3,713,496.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Van Santen, Aart; and Sodergard, Bengt, 3,713,971.

Allner, Olaf. Circuit arrangement with capacity diode tuning for displaying tuning frequencies. 3,714,584, Cl. 325-455.000.

Allswede, Keith A.: *See—*
Davis, Ralph A.; and Allswede, Keith A., 3,714,336.

Almasi, Gabriel Charles; and Slusarczyk, William, to Crucible Inc. Flocculating apparatus and method. 3,714,037, Cl. 210-42.000.

Alotta, Renard M. Fishhook Caddy. 3,713,244, Cl. 43-57.50r.

Altec Manufacturing Company, Inc.: *See—*
Hafner, Oliver B., 3,713,717.

Aluminum Company of America: *See—*
Lawrence, Kenneth C.; and Mills, James B., 3,713,545.

Alwin Manufacturing Company, Inc.: *See—*
Dashnier, Merwin J.; and Diring, James A., 3,713,569.

Amalgamated Music Enterprises, Inc.: *See—*
Rogalski, Theodore, 3,714,575.

Amamchian, Sergei Grigorievich: *See—*
Arutjunian, Vladimir Semenovich; and Amamchian, Sergei Grigorievich, 3,714,542.

Amboss, Kurt. Electron optic system utilizing a focusing electrode having a more positive voltage than the two adjacent electrodes. 3,714,504, Cl. 315-31.00r.

American Cyanamid Company: *See—*
Gershberg, David Benedict, 3,714,136.
Lantos, Ivan, 3,714,181.
Los, Marinus, 3,714,195.
Stearns, Edwin Ira, 3,714,667.
Stretanski, Joseph Anthony, 3,714,114.

American Home Products Corporation: *See—*
Alburn, Harvey E.; and Fletcher, Horace, III, 3,714,248.
Bell, Stanley C.; and Childress, Scott J., 3,714,145.
Bell, Stanley C.; and Gochman, Carl, 3,714,188.
Diebold, James L.; and Wolf, Milton, 3,714,253.

Sellstedt, John H.; and Bell, Stanley C., 3,714,150.
Wei, Peter H. L.; and Bell, Stanley C., 3,714,147.
Wei, Peter H. L., 3,714,218.
Wolf, Milton; and Diebold, James L., 3,714,093.

American Metal Climax, Inc.: *See—*
Bernath, Kornel; Moffett, S. Neil; and Papafingos, Pandelis N., 3,713,904.

American Optical Corporation: *See—*
Shaw, Robert R.; and Robinson, Charles C., 3,714,059.

American Standard Inc.: *See—*
Frederick, Claud, Jr.; and Woodrum, Harold L., 3,713,217.

American Telephone and Telegraph Company: *See—*
Berryman, Robert Dean; Erickson, Donald Henry; and Raphel, Julio Cesar (said Erickson assor. to), 3,714,380.

American Totalisator Company, Inc.: *See—*
Ray, Joseph, 3,713,674.

Ammann, Robert W.; Creasy, James R.; and Dorenbos, David O., to GTE Automatic Electric Laboratories, Incorporated. Computer implemented method of detecting an isolating electrical faults in core memory systems. 3,714,403, Cl. 235-153.0ac.

Amoco Production Company: *See—*
Fast, Clarence R.; and Mallinger, Morton A., 3,713,489.
Fast, Clarence R., 3,713,915.
Freeman, Francis R.; and Vitali, Joseph D., 3,714,590.
O'Connor, Donald J.; and Fast, Clarence R., 3,713,393.

AMP Incorporated: *See—*
Dinger, Leon Joel, 3,713,622.
Fendrich, Charles Nelson, Jr., 3,714,511.
Reynolds, Charles Edward, 3,713,670.
Wells, Richard Farner; and Fry, Robert Eden, 3,714,530.

Analog Technology Corporation: *See—*
Josias, Conrad S.; Bowman, Lloyd D.; and Lovelock, James E. (said Lovelock assor. to), 3,714,421.

Ananchenko, Sopia Nikolaevna: *See—*
Zakharychev, Ardalion Vladimirovich; Serebryakova, Tatyana Andreevna; Ananchenko, Sopia Nikolaevna; and Torgov, Igor Vladimirovich, 3,714,235.

Andersen, Arne O., to Walker Forge, Inc. Method of handling metal stock for hot forgin. 3,713,320, Cl. 72-361.000.

Anderson, Frank B.: *See—*
Carner, John W.; and Anderson, Frank B., 3,714,304.

Anderson, Frank B., mesne: *See—*
Carner, John W.; and Anderson, Frank B., 3,714,304.

Anderson, Moffat: *See—*
Dawson, Peter S. S.; Kurz, Wolfgang G. W.; Anderson, Moffat; and York, Arthur E., 3,713,988.

Anderson, Robert G., to Chevron Research Company. Method of washing with linear alkyl vicinal disulfates. 3,714,076, Cl. 252-550.000.

Anderson, Weston A.; and Helmer, John C., to Varian Associates. Beam focus coils for induced emission apparatus. 3,714,417, Cl. 250-49.5ae.

Anderson, William S. Cyclopentadienylmanganese tricarbonyl compounds as a catalyst for the radiation curing of polyepoxides. 3,714,006, Cl. 204-159.140.

Andrew, Eugene A., to Olin Corporation. Safety system for explosive powder storage bin. 3,713,359, Cl. 86-1.000.

Angelini, Dominic J., to Xerox Corporation. Photoreceptor interface. 3,713,821, Cl. 96-1.500.

Angeloff, Charles J. Method of manufacture of bow string. 3,714,316, Cl. 264-230.000.

Anglo American Corporation of South Africa Limited: *See—*
Swanepoel, Lourens Petrus, 3,714,558.

Anselrode, Lodewijk; and Anthonis, Sint, to Stork Amsterdam N.V. Method for the galvano technical manufacture of cylindrical thin-walled screen stencils for the rotary screen printing process. 3,713,997, Cl. 204-11.000.

Anthonis, Sint: *See—*
Anselrode, Lodewijk; and Anthonis, Sint, 3,713,997.

Antlfinger, George J.: *See—*
Knechtges, Donald P.; and Antlfinger, George J., 3,714,101.

Apikos, Dominic, to Atlantic Richfield Company. Strippable wax coating compositions. 3,714,094, Cl. 260-28.5an.

Appel, Marvin: *See—*
Blumenthal, Jack L.; Ogren, John R.; and Appel, Marvin, 3,713,901.

Appleton, Arthur I. Canted fuse element. 3,714,613, Cl. 337-295.000.

Appleton, Arthur I. Terminal block connectors. 3,714,618, Cl. 339-198.00r.

Appleton Electric Company: *See—*
Stephensen, Allan P., 3,714,415.

Applied Aluminum Research Corporation: *See—*
Toth, Charles; Bailey, Raymond V.; and Harris, Harry G., Jr., 3,713,809.
Toth, Charles; and Harris, Harry Gordon, Jr., 3,713,811.

Applied Radiation Corporation: *See—*
Link, William T.; and Hatch, Laurie G., 3,714,416.

Apsit, Voldemar Voldemarovich; Kokle, Juris Leovich; Skrutzitis, Karl Ernestovich; and Schukin, Mikhail Ivanovich, to Fiziko-Energeticheskiy Institut Akademir Nauk. Heteropolar inductor generator. 3,714,480, Cl. 310-170.000.

Arai, Hiroshi; and Mori, Takakazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for supplying rotational speed signals. 3,714,458, Cl. 307-120.000.

Arakane, Hiroyasu: *See—*
Fujiwara, Ryozo; Ohaha, Eiji; Maeda, Kazuo; Terada, Fumio; Sugino, Toshiyuki; Arakane, Hiroyasu; and Watanabe, Yoshimoto, 3,714,340.

Araki, Kazumi: *See—*
Nakayama, Kiyoshi; and Araki, Kazumi, 3,713,977.

Araneida, Inc.: *See—*
Wallace, Donald G.; and Turek, James A., 3,713,544.

Archer, Sydney; and Rosi, David, to Sterling Drug Inc. 4-aminoalkylamino-2-halo-benzyl alcohols and alkyl ethers thereof. 3,714,167, Cl. 260-268.00c.

Ariizumi, Yoshio: *See—*
Kimura, Yutaka; Ariizumi, Yoshio; Masuda, Yutaka; Yamagami, Teruhiro; and Okita, Yasushi, 3,714,378.

Arita, Yukio; and Ninomiya, Katsuya, to Mitsubishi Jukogyo Kabushiki Kaisha. Ship mooring arrangement and a submerged oil storage tank. 3,713,415, Cl. 114-230.000.

Aritomi, Choji, to Idemitsu Kosan Co., Ltd. Automatic measurement of viscosity. 3,713,328, Cl. 73-55.000.

Armbrust, Herbert: *See—*
Sturm, Hans Juergen; and Armbrust, Herbert, 3,714,240.

Armoco Production Company: *See—*
Askew, Warren S.; and Froning, H. R., 3,714,062.

Arnaud, Jose L., to FMC Corporation. Process for preparing strontium carbonate. 3,714,329, Cl. 423-431.000.

Arnett, Hager F.; and Smith, Reginald A., to Mansfield Aircraft Products Co. Beverage brewing device. 3,713,377, Cl. 99-283.000.

Arnold, James F., to Hydrocouple Corporation. Method for connecting tubular members. 3,713,204, Cl. 29-460.000.

Arrott, Janice J. Endotracheal tube holder. 3,713,448, Cl. 128-351.000.

Arscott, Raymond L.; Gaylord, Eber W.; Mori, Ernest A.; and Morris, Richard A., to Gulf Research & Development Company. Method and apparatus for treating drilling mud. 3,713,499, Cl. 175-66.000.

Arutjunian, Vladimir Semenovich; and Amamchian, Sergei Grigorievich. Excitation system for a synchronous machine. 3,714,542, Cl. 322-59.000.

Asahara, Yoshiyuki: *See—*
Izumitani, Tetsuro; Asahara, Yoshiyuki; Tsuchiyz, Makoto; and Nagarekawa, Osamu, 3,714,073.

Asgeirsson, Asgeir, to Cabot Corporation. Thickened organic liquids. 3,714,041, Cl. 252-13.000.

Ashby, George E.: *See—*
Mac Cragh, Adolfo P.; Patil, Arvind S.; and Ashby, George E., 3,713,816.

Asher, Ralph L., to International Telephone and Telegraph Corporation. Analog bearing measuring system. 3,714,658, Cl. 343-106.00r.

Ashland Oil & Refining Company: *See—*
Culberston, Billy M., 3,714,129.

Asker, Gunnar C. F.; and Hubscher, Maurice A. Heat and moisture exchange packing. 3,713,281, Cl. 55-387.000.

Askew, Warren S.; and Froning, H. R., to Armoco Production Company. Straight chain sulfonates for use in solubilize oil-water solutions for miscible waterflooding. 3,714,062, Cl. 252-308.000.

Associated Electric Industries, Limited: *See—*
Lucas, Jeffrey H., 3,714,423.

Astle, Thomas W., to Kanton, Fred S. Device and method for testing potency of biological control reagents. 3,713,985, Cl. 195-103.50r.

Atara Corporation: *See—*
Slater, Robert W., 3,714,036.

Atlantic Richfield Company: *See—*
Apikos, Dominic, 3,714,094.
McCoy, John J.; and Yoo, Jin Sun, 3,714,185.
Nakaguchi, Glenn M.; Wang, Ting-I.; and Caserio, Frederick F., Jr., 3,714,202.
Verdol, Joseph A.; Ryan, Patrick W.; and Carrow, Donald J., 3,714,110.

Atwell, Everett C.; and Ballard, Homer Lee, to Burlington Industries, Inc. Spinning tape. 3,713,347, Cl. 74-231.00r.

Au, Kenneth K., to Microsystems International Limited. Single-channel MIS flip-flop circuit. 3,714,471, Cl. 307-279.000.

Augl, Joseph M., to United States of America, Navy. Phenylated pyromellitimides. 3,714,189, Cl. 260-326.00c.

Auphan, Michel Joseph; and Perilhou, Jean Robert, to U.S. Philips Corporation. Liquid analyzing device. 3,713,777, Cl. 23-259.000.

Auskern, Allan, to United States of America, Atomic Energy Commission. Bone substitute. 3,713,860, Cl. 117-8.500.

Austin, Lewis M.; Denman, Robert R.; O'Donnell, Thomas P.; and Veres, Frank, to Owens-Illinois, Inc. Product and method for making same. 3,713,728, Cl. 350-310.000.

Austin, Thomas Howard: *See—*
Lichtenwalter, Myrl; and Austin, Thomas Howard, 3,714,259.

Automation Industries, Inc.: *See—*
Munger, Donald W., 3,713,329.

Autoscan, Inc.: *See—*
Pelta, Edmond R.; and Gold, Kenneth Stewart, 3,714,499.

Avakian, Jury Vardkesovich: *See—*
Markosian, Marlen Mamukovich; Shermazanian, Yakov Tigranovich; Kazanxhian, Grigory Paravonovich; Avakian, Jury Vardkesovich; and Vartanian, Albert Vartanovich, 3,713,727.

Avco Corporation: *See—*
Cronstedt, Val, 3,713,711.
Luthman, Paul A.; Stein, Maria; and Fischer, Thomas R., 3,713,661.
Watkins, Sidney C., 3,713,591.

Averin, Vyacheslav Vasilievich: *See—*

Cherkasov, Petr Alexeevich; Kuznetsov, Evgeny Mikhailovich; Averin, Vyacheslav Vasilievich; and Samarin, Alexandr Mikhailovich, 3,713,995.

Azelkas, Walter G.: *See—*
Clowers, Earl R.; and Azelkas, Walter G., 3,713,185.

B. V. S.: *See—*
Thillet, Georges, 3,713,559.

Baba, Takesi; Osada,Koichi; Hokawa, Takuya; and Suzuki, Fumio, to Hitachi, Ltd. and Japanese National Railways. Mobile communication system. 3,714,574, Cl. 325-51.000.

Bader, Andre; and Weiss, Francis. Hydroxy alkylene ethers of divinyl glycol. 3,714,265, Cl. 260-611.00b.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Erdmann, Hans; and Miller, Franz Friedrich, 3,714,211.
Kiefer, Hans; and Fischer, Adolf, 3,714,252.
Mueller, Herbert; Koernig, Wolfgang; and Koehl, Harald, 3,714,285.
Pfannmueller, Helmut; Urban, Friedrich; Gropper, Hans; and Gierth, Volker, 3,714,135.
Sturm, Hans Juergen; and Armbrust, Herbert, 3,714,240.

Baglai, Vitaly Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Baglai, Vitaly Mikhailovich; and Alferov, Jury Fedorovich, 3,713,476.

Bailey, Donald T.: *See—*
Cook, Melvin Alonzo; and Bailey, Donald T., 3,713,914.

Bailey, Raymond V.: *See—*
Toth, Charles; Bailey, Raymond V.; and Harris, Harry G., Jr., 3,713,809.

Baker, Alfred R. Harvesting apparatus. 3,713,282, Cl. 56-328.00r.

Baker, Don R.; and Teach, Eugene G., to Stauffer Chemical Company. Carbonates of 3'- and 4'-hydroxybromoacetanilides. 3,714,219, Cl. 260-463.000.

Baker, Hugh M., Jr., to HB Engineering Corporation. Resonator having counter rotating rigid parts. 3,714,475, Cl. 310-8.250.

Baker, Silveus M.: *See—*
Moore, Wesley D.; and Baker, Silveus M., 3,714,479.

Baldwin, Roger A.; and Cheng, Ming T., to Kerr-McGee Corporation. Process for the nitrosation of M-cresol. 3,714,267, Cl. 260-62.00n.

Balje, Otto Erich; Bouchard, Constant L.; Knowles, James; Kosacheff, Dimitri; Pulick, Emil A.; Pulick, Michael A.; and Topouzian, Armen, to Ford Motor Company. Exhaust reactor auxiliary power unit and regenerative. 3,713,294, Cl. 60-303.000.

Ballard, Homer Lee: *See—*
Atwell, Everett C.; and Ballard, Homer Lee, 3,713,347.

Balsam, Gunter; and Kuener, Otto, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the preparation of peruvoside. 3,713,980, Cl. 195-32.000.

Bandurco, Victor; and Shroff, James R., to USV Pharmaceutical Corporation. Imino-benzyl-pyrazoles. 3,714,182, Cl. 260-310.00r.

Bangor Punta Operations, Inc.: *See—*
Charron, Dwayne W., 3,713,362.

Bardin, Robert S. Cooking utensil. 3,713,380, Cl. 99-422.000.

Barker, James E., to Cities Service Company. Treatment of phosphoric acid to recover alkali metal fluosilicates. 3,714,330, Cl. 423-321.000.

Barnard, Daniel D., to Bendix Corporation, The. Fluidic timer. 3,713,456, Cl. 137-81.500.

Barnard, Leonard: *See—*
Mallette, Gertrude E., 3,713,178.

Barnes, Clare Earl; and Owen, Brian, to Bell Telephone Laboratories, Incorporated. Broadband circulator having multiple resonance modes. 3,714,608, Cl. 333-1.100.

Barnett, David W.: *See—*
Riggs, Olen L., Jr.; and Barnett, David W., 3,714,004.

Barone, Bruno J.: *See—*
Croce, Louis J.; and Barone, Bruno J., 3,714,243.

Barrere, Clem A., Jr.; and Casad, Burton M., to Continental Oil Company. Process for recovering condensible components from a gas stream. 3,713,272, Cl. 55-33.000.

Bartelink, Dirk Jan; and Persky, George, to Bell Telephone Laboratories, Incorporated. Planar semiconductor device utilizing confined charge carrier beams. 3,714,473, Cl. 307-299.000.

Barton, Sterling C.: *See—*
De Mania, Dominio; Shartrand, Allan C.; and Barton, Sterling C., 3,714,478.

Basford, Kenneth Arnold: *See—*
Johnson, Christopher Linley; Whitmarsh, John Robert William; and Basford, Kenneth Arnold, 3,713,344.

Bashkirsky Nauchno-Issledovatelsky Institut Po: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.

Bate, Robert Thomas, to Texas Instruments, Incorporated. Magnetic field sensor. 3,714,523, Cl. 317-235.00r.

Bate, Robert Thomas, to Texas Instruments, Incorporated. Method of measuring magnetic fields utilizing a three dram IGFET with particular bias. 3,714,559, Cl. 324-43.00r.

Battelle Development Corporation, The, mesne: *See—*
Thomas, George I., 3,713,441.

Bauer, Alfons. Device for indicating and recording the speed of travel and the distance travelled by motor vehicles. 3,714,662, Cl. 346-18.000.

Baum, Melvin E.; and Hatton, John A., Jr., to Koppers Company, Inc. Chemically thickened polyester resin. 3,714,292, Cl. 260-865.000.

Baum, Melvin E.; and Hatton, John A., Jr., to Koppers Company, Inc. Chemically thickened polyester resin. 3,714,293, Cl. 260-865.000.

Baum, Melvin E.; and Hatton, John A., Jr., to Koppers Company, Inc. Chemically thickened polyester resin. 3,714,294, Cl. 260-865.000.

Baumann, Bernard: *See—*
Cachan, Jean Cospen; and Baumann, Bernard, 3,713,956.

Baumwolspiner, Milton, to Bell Telephone Laboratories, Incorporated. Digital filter employing serial arithmetic. 3,714,402, Cl. 235-152.000.

Bausch & Lomb Incorporated: *See—*
Letter, Eugene C., 3,713,996.

Bausch & Lomb Incorporation: *See—*
Morante, Robert J., 3,713,724.

Baxter Laboratories, Inc.: *See—*
Regan, Bernard M., 3,714,271.

Bayha, Charles Edward; and Madden, Thomas Raymond, to Reichhold Chemicals, Inc. Method for producing dialkylated diarylamines. 3,714,257, Cl. 260-576.000.

Bayha, Charles Edward; and Madden, Thomas Raymond, to Reichhold Chemicals, Inc. Dialkylated diarylamines and a method for producing same. 3,714,258, Cl. 260-576.000.

Bayless, Jay J. Vehicle door collision plate and latch. 3,713,691, Cl. 296-152.000.

BDH Chemicals Limited: *See—*
Vecht, Aron, 3,714,339.

Bea-Verpackungamaschinen Cast: *See—*
Wierick, Horst, 3,713,951.

Beagle Manufacturing Company: *See—*
McCracken, Robert S., 3,713,958.

Beal, Lawrence E., to Eagle-Picher Industries, Inc. Tire building machine with telescopic interconnection for mounting a bead ring holder. 3,713,950, Cl. 156-401.000.

Beal, Walter; Hobday, Cyril; Jack, James; and Keenan, John Francis Edmund, to Ciba-Geigy Corporation. Process for the dyeing of aromatic polyamide fibres. 3,713,769, Cl. 8-173.000.

Beall, George H., to Corning Glass Works. Reduced silica-nucleated glass-ceramic articles. 3,713,854, Cl. 106-39.0dv.

Bear, David L.; and Plurkowsky, Stephen W., to Mattel, Inc. Doll having posable arm joined thereto by elastically stretched connector. 3,713,252, Cl. 46-120.000.

Beaufour, Albert H.; and Renault, Jean A. Amino pyrimidine derivatives and their preparation. 3,714,165, Cl. 260-256.40n.

Beausoleil, William F., to International Business Machines Corporation. Monolithic memory utilizing defective storage cells. 3,714,637, Cl. 340-173.00r.

Beavers, Jack L., to Design Products, inc. Free-standing panel system. 3,713,257, Cl. 52-36.000.

Beck, Don D. Endless cable way for transporting pipe. 3,713,547, Cl. 214-2.500.

Beckerbauer, Richard, to Du Pont de Nemours, E. I., and Company. Unsaturated-hydroperfluoroalkylsulfonyl fluorides. 3,714,245, Cl. 260-543.00f.

Beckers, Norman L., to Diamond Shamrock Corporation. Chlorinated hydrocarbons stabilized with alkoxyaldehyde hydrazone and glycidol. 3,714,052, Cl. 252-171.000.

Becton, Dickinson and Company: *See—*
Shapiro, Stephen, 3,713,780.

Becton, Dickinson Electronics Company: *See—*
Epstein, Howard C., 3,714,476.

Beeler, David R.: *See—*
Copeland, Robert L.; Gamble, Bobby G.; Chase, Vance A.; and Beeler, David R., 3,713,961.

Beenhakker, Albertus Hendrik; and Felthuis, Jacob, to Koninklijke Nederlandsche Hoogovens en Staalfabrienken N.V. Heat regenerator, particularly a hot blast stove for a blast furnace plant. 3,713,632, Cl. 263-19.00r.

Beerli, George: *See—*
Ackerman, Joseph Francis; Beerli, George; Savageau, Robert George; and Weisfeld, Joseph, 3,713,864.

Beers, Melvin D.: *See—*
Hamilton, Stephen B.; Beers, Melvin D.; Berger, Abe; and Selin, Terry G., 3,714,089.

Beet Sugar Development Foundation: *See—*
Bernhardt, Walter O., 3,713,738.

Beiding, William A.; Emenson, Robert B.; and Williams, Raymond L., to Kaiser Aluminum & Chemical Corporation. Agglomerating partially dehydrated gel-derived pseudoboehmitic alumina to form strong porous spheres. 3,714,313, Cl. 264-117.000.

Beike, Hans. Process and apparatus for the fine comminution of solids. 3,713,592, Cl. 241-17.000.

Belisle, Walter R. Curtains for airport ramps. 3,713,183, Cl. 14-71.000.

Bell & Howell Company: *See—*
Engelstein, Stanley; and Dorman, Isidore, 3,713,535.
Johnston, Robert F., 3,713,733.

Bell & Howell Company, mesne: *See—*
Singh, Digjit, 3,714,596.

Bell Canada-Northern Electric Research Limited: *See—*
Dodson, Arthur Edward, 3,714,461.

Bell, Michael J.; and Whatley, Marvin E., to United States of America, Atomic Energy Commission. Method for preparing high purity 233 uranium. 3,714,322, Cl. 423-5.000.

Bell, Stanley C.: *See—*
Sellstedt, John H.; and Bell, Stanley C., 3,714,150.
Wei, Peter H. L.; and Bell, Stanley C., 3,714,147.

Bell, Stanley C.; and Childress, Scott J., to American Home Products Corporation. 1,4-Benzodiazepine-2-ones and intermediates therefor. 3,714,145, Cl. 260-239.30d.

Bell, Stanley C.; and Gochman, Carl, to American Home Products Corporation. Process for the preparation of 3-aryl-2-1 mino-3-indolinols and amnno-3-aryl-3h-indol-3-ols and related compounds. 3,714,188, Cl. 260-326.150.

Bell Telephone Laboratories, Incorporated: *See—*
Barnes, Clare Earl; and Owen, Brian, 3,714,608.
Bartelink, Dirk Jan; and Persky, George, 3,714,473.
Baumwolspiner, Milton, 3,714,402.
Berryman, Robert Dean; Erickson, Donald Henry; and Raphel, Julio Cesar (said Berryman and Raphel assor. to), 3,714,380.
Bobeck, Andrew Henry, 3,714,640.
Clemetson, Warren Jay; and Kurokawa, Kaneyuki, 3,714,460.
Eisenberger, Peter Michael; and Schmidt, Paul Herman, 3,714,420.
Kinsel, Tracy Stewart, 3,714,437.
Kish, Donald Eugene; and Smith, James Lanson, 3,714,639.
Lepselter, Martin Paul; and MacRae, Alfred Urquhart, 3,713,922.
Lukacs, Michael Edward, 3,714,505.
Schwartz, Bertram, 3,713,912.

Bembridge, Henry; and Venn-Brown, Geoffrey C., to Procor Limited. Tank car. 3,713,399, Cl. 105-358.000.

Bencze, William Laszlo, to Ciba-Geigy Corporation. α-(Benzcycloalkylphenyl)-aliphatic acids as antiinflammatory and hypocholesterolemic agents. 3,714,360, Cl. 424-317.000.

Bendix Corporation, The: *See—*
Barnard, Daniel D., 3,713,456.
Bright, Edward J.; and Fairbairn, Le Roy W., 3,714,617.
Kadron, Stanley F., 3,714,582.
Krivak, Michael T.; Reynolds, Gibson; and Prapis, Frank, 3,714,535.
Kwolek, John P., 3,714,319.
McCombs, Howard Lewis, Jr., 3,713,366.
Morton, Henry C., 3,713,934.

Benedix, Walter, to Bosch, Robert, G.m.b.H. Arrangement for determining the timing of ignition of a cylinder of an internal combustion engine. 3,714,554, Cl. 324-16.00r.

Bengoa, Jose E. Apparatus for indicating the volume of material in a vessel or tank. 3,713,224, Cl. 33-126.700.

Bennett, David B.; Follen, Robert J.; and Harman, Charles P., Jr., to Honeywell Inc. Time-to-collision circuitry for collision warning system. 3,714,648, Cl. 343-5.0dp.

Bennett, John, to Sun Oil Company (Delaware). Bearing seal. 3,713,707, Cl. 308-8.200.

Benson, Carl F., to Torrington Company, The. Preloaded incremental feed device. 3,713,349, Cl. 74-409.000.

Ber, Andre Lucas, Netherlands: *See—*
Maat, Hendrik Jan; and Ber, Andre Lucas, Netherlands, 3,714,072.

Berdrin, Albert. Alternative input drives on housing of gearbox for tools rotating about vertical axes. 3,713,494, Cl. 172-59.000.

Berg, Genrikh Arturovich: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.

Berg Manufacturing Company, The, mesne: *See—*
Campanini, Sergio, 3,713,702.

Berger, Abe: *See—*
Hamilton, Stephen B.; Beers, Melvin D.; Berger, Abe; and Selin, Terry G., 3,714,089.

Bergmeyer, Hans Ulrich; Haid, Erich; Hochstetter, Michael; and Weimann, Gunter, to Boehringer Mannheim G.m.b.H. Indicator for the determination of reduced pyridine coenzymes. 3,713,986, Cl. 195-103.50r.

Bergomi, Joseph G., Jr., to Monsanto Company. Aqueous coating composition comprising a polyblend of E/VC/A and polyacrylamide. 3,714,104, Cl. 260-29.6wb.

Bergomi, Joseph G., Jr., to Monsanto Company. Polyblend of ethylen/vinyl chloride/acrylamide interpolymer and polyacrylamide. 3,714,298, Cl. 260-897.00c.

Berman, Elliot; and Philbrick, Richard W., to Itek Corporation. Photographic contrast control. 3,713,823, Cl. 96-48.0hd.

Bernath, Kornel; Moffett, S. Neil; and Papafingos, Pandelis N., to American Metal Climax, Inc. Composition and method for producing corrosion resistant and protective coatings on aluminum and aluminum alloys. 3,713,904, Cl. 148-6.160.

Bernhardt, Walter O., to Beet Sugar Development Foundation. Method and apparatus for rapidly and selectively determining purity of process streams. 3,713,738, Cl. 356-73.000.

Bernier, Chester A., to Square D Company. Selectively mountable motor starter unit with reversibly positionable circuit breaker operating mechanism. 3,714,387, Cl. 200-168.00r.

Berry, Thomas E., to Shell Oil Company. Zinc-containing zeolite catalyst. 3,714,029, Cl. 208-111.000.

Berryman, Robert Dean; Erickson, Donald Henry; and Raphel, Julio Cesar, said Berryman and Raphel assor. to Bell Telephone Laboratories, Incorporated and said Erickson assor. to American Telephone and Telegraph Company. Control arrangement for directionalizng audio transmission. 3,714,380, Cl. 179-18.0ah.

Berstein, Gregor; Hardy, John F.; and Doppler, Leonard H., to Cabot Corporation. Silica-urea formal dehyde polymer combination flatting additive composition. 3,714,085, Cl. 260-39.0sb.

Berstein, Theodore; and Miller, Joseph G. Combination fluid flow speed and direction transducer. 3,713,336, Cl. 73-189.000.

Berthelot, Maurice Paul: *See—*
Bertin, Jean Henri; Berthelot, Maurice Paul; and Delamare, Guy Robert, 3,713,507.

Berthold, Wolfgang K.: *See—*
Williams, Robert G.; and Berthold, Wolfgang K., 3,714,439.

Bertin, Jean Henri; Berthelot, Maurice Paul; and Delamare, Guy Robert, to Societe d'Etudes et de Developpement des Aeroglisseurs Marins Terrestres et Amphibies S.E.-D.A.M. Facility for confining a pressurised fluid cushion for a ground-effect machine. 3,71,507, Cl. 180-127.000.

Bertolacini, Ralph J.; and Radford, Herschel D., to Standard Oil Company. Process for treating a high-boiling petroleum hydrocarbon feedstock. 3,714,032, Cl. 208-216.000.

Beschmann, Horst; and Wanner, Ernst. Joint of light metal parts. 3,713,679, Cl. 287-189.36d.

Besenbruch, Alex; and Hofmann, Arthur R., to Besenbruch-Hofman, Inc. Adjustable grinding tool for brake cylinders and the like. 3,713,256, Cl. 51-353.000.

Besenbruch-Hofman, Inc.: *See—*
Besenbruch, Alex; and Hofmann, Arthur R., 3,713,256.

Bestenreiner, Friedrich; Deml, Reinhold; Kubitzek, Alfred; and Borowski, Kurt, to Agfa-Gevaert Aktiengesellschaft. Distance measuring apparatus. 3,714,435, Cl. 250-83.30a.

Betremieux, Pierre Arthur; Feissel, Henri Gerard; Gallard, Jean Hilaire; and Lagadec, Isidore, to Societe Industrielle Honeywell Bull. Memory matrix and its process of fabrication. 3,713,885, Cl. 117-212.000.

Betz Laboratories, Inc.: *See—*
Wiley, David R., 3,713,792.

Beyer, Gerhard; and Nagelsmann, Hermann, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius and Bruning. Filter- and screen cloths made from coated polyester material. 3,713,875, Cl. 117-98.000.

Biale, Giovanni, to Union Oil Company of California. Self-crosslinking vinyl acetate latices. 3,714,096, Cl. 260-29.4ua.

Biale, Giovanni, to Union Oil Company of California. Self-crosslinking vinyl acetate-ethylene latexes. 3,714,099, Cl. 260-29.6ta.

Biale, Giovanni; and Pilling, Richard L., to Union Oil Company of California. Crosslinkable vinyl acetate latices. 3,714,100, Cl. 260-29.6ta.

Bianchi, Nereo, to Necchi S.p.A. Work clamp for sewing machines. 3,713,405, Cl. 112-76.000.

Bianchino, Daniel C. Mannequin structure. 3,713,375, Cl. 95-82.000.

Biddison, John M., to Globe Tool and Engineering Company, The. Automatic armature winding. 3,713,209, Cl. 29-597.000.

Biggar, F. M., Jr.: *See—*
Hunt, Robert A., 3,713,223.

Bigland, Bernard Keith, to General Engineering Co., (Radcliffe) Ltd. Manufacture of plastic film. 3,714,309, Cl. 264-89.000.

Bijl, Cornelis Leendert: *See—*
Vrijburg, Hans Gerhard; and Bijl, Cornelis Leendert, 3,713,902.

Bio-Dynamics, Inc.: *See—*
Schmitz, William David, 3,713,775.

Bird Machine Company: *See—*
Nelson, George L., 3,713,541.

Biren, Steven; and Costello, Thomas V., to United States of America, Navy. Sonic aircraft/vehicle discriminator. 3,714,620, Cl. 340-15.000.

Birko, Arnold: *See—*
Dennis, Herman W.; and Birko, Arnold, 3,713,944.

Bittner, Friedrich: *See—*
Pfleger, Hans; Bittner, Friedrich; and Meffert, Paul, 3,714,331.

Bizerba-Werke Wilhelm Kraut KG: *See—*
Muller, Ernst; and Maurer, Albrecht, 3,713,470.

Bjorksten, Johan. Method for making fiber reinforced plastic. 3,713,945, Cl. 156-278.000.

Blachere, Henri T.; and Jamart, Guy Georges, to Institut National de la Recherche Atominique: Etablissements Gourdon. Apparatus for optical measurements of microbial cultures. 3,714,445, Cl. 250-218.000.

Black Clawson Company, The: *See—*
Blakley, Earl T.; Chupka, David E.; Harbron, Donald L., Jr.; Marsh, Paul G.; and Seifert, Peter, 3,713,594.
Marsh, Paul G., 3,714,038.

Black, Delbert L. Hydraulic system for individually controlling a plurality of hydraulic motors. 3,713,296, Cl. 60-452.000.

Blackmer, David E. Multiplier circuits. 3,714,462, Cl. 307-229.000.

Blaise, Jean; and Grimaud, Edouard, to Ugine Kuhlmann. Hydroxy halogenated elastomers resistant to oils. 3,714,297, Cl. 260-890.000.

Blakley, Earl T.; Chupka, David E.; Harbron, Donald L., Jr.; Marsh, Paul G.; and Seifert, Peter, to Black Clawson Company, The. Waste treatment system. 3,713,594, Cl. 241-46.080.

Blanchard, Houston F., to General Motors Corporation. Occupant restraint system. 3,713,667, Cl. 280-150.0ab.

Bloom, Philip A.; Hussey, Stuart J.; and Evans, Lamar G., to United States of America, Interior. Recovery of molybdenite. 3,714,325, Cl. 423-53.000.

Blowers, William L.: *See—*
Bruning, Harry F., Jr.; and Blowers, William L., 3,714,569.

Blumenthal, Jack L.; Ogren, John R.; and Appel, Marvin, to TRW Inc. Oxidation resistant refractory alloys. 3,713,901, Cl. 148-6.300.

Bobeck, Andrew Henry, to Bell Telephone Laboratories, Incorporated. Single wall domain propagation arrangement. 3,714,640, Cl. 340-174.0tf.

Bobst Champlain, Inc.: *See—*
Spika, Wolfram, 3,713,648.

Boehringer Mannheim G.m.b.H.: *See—*
Bergmeyer, Hans Ulrich; Haid, Erich; Hochstetter, Michael; and Weimann, Gunter, 3,713,986.

Boekhorst, Antonius, to U.S. Philips Corporation. Circuit arrangement including an auxiliary coil for generating a magnetic field periodically varying with time and being adjustable in amplitude. 3,714,495, Cl. 315-13.00c.

Bogdan, Louis J.; and Culp, Jere S., to Kelsey-Hayes Company. Self leveling tractor seat. 3,713,617, Cl. 248-371.000.

Bohmann, Otto Alwin Ludwig, to N.V. Rubberfabriek Vredestein. Overboot. 3,713,232, Cl. 36-7.300.

Boies, David B.: *See—*
Northan, Barbara J.; and Boies, David B., 3,714,069.

Boissier, Jacques Robert; and Ratouis, Roger, to Roussel-UCLAF. 6-Thiochroman-acetic-acid compounds. 3,714,190, Cl. 260-327.0th.

Bom, Pieter Robert. Flash evaporator. 3,713,989, Cl. 202-173.000.

Bonet, Claude: *See—*
Foex, Marc; Delmas, Robert; and Bonet, Claude, 3,714,390.

Boone, Donald H.; Koss, Donald A.; and Peacock, David E., to United Aircraft Corporation. Cast cobalt-base eutectic type alloy. 3,713,815, Cl. 75-171.000.

Borden Inc.: *See—*
Cautilli, Philip A.; and Makower, Samuel J., 3,714,097.
Stehle, Peter Fallon; Wu, Chan K.; Loshaek, Samuel; and Dickstein, Jack, 3,714,105.

Bordessoule, Rene F.; Kermabon, Andre J.; and De Vera, Serge, to Compagnie Francaise des Petroles and Comex-Equipment. Submersible catamaran for the placement and withdrawal of packages on a water bottom. 3,713,411, Cl. 114-16.00e.

Bordon Company, The: *See—*
Roberts, Victor I.; and Messervey, Clifford H., 3,713,326.

Borg-Warner Corporation, mesne: *See—*
Dever, James L.; and Hodan, James John, 3,714,302.

Borowski, Kurt: *See—*
Bestenreiner, Friedrich; Deml, Reinhold; Kubitzek, Alfred; and Borowski, Kurt, 3,714,435.

Borrel, Philippe; and Lehureau, Jean, to Progil. Process for photopolymerizing unsaturated polyester resins in contact with immiscible liquids. 3,714,007, Cl. 204-159.150.

Bosch, Robert, G.m.b.H.: *See—*
Adler, Karl-Heinz, 3,713,427.
Benedix, Walter, 3,714,554.
Knapp, Heinrich; and Schwartz, Reinhard, 3,713,430.
Muller, Wolfram, 3,713,505.
Vesterling, Karin, 3,714,514.

Bostick, Edgar E.: *See—*
Fleischer, Robert L.; Price, Paul B.; Bostick, Edgar E.; and Holub, Fred F., 3,713,921.

Bottasso, Franco; Pacciarini, Antonio; and Caretta, Renato. Method for partially curing building up pneumatic tires. 3,713,929, Cl. 156-127.000.

Botz, Roland, to Plasti-Fiber Formulations, Inc. Bagasse reinforced resin bodies and method of making same. 3,714,084, Cl. 260-9.000.

Bouchard, Constant L.: *See—*
Balje, Otto Erich; Bouchard, Constant L.; Knowles, James; Kosacheff, Dimitri; Pulick, Emil A.; Pulick, Michael A.; and Topouzian, Armen, 3,713,294.

Boussac, Jean-Claude. Method of articles of clothing. 3,713,174, Cl. 2-74.000.

Bouvier, John J., to Ferro Corporation. Method of making diamond coated surface. 3,713,795, Cl. 51-295.000.

Bowden, Woodrow R., Jr.; Owen, Dave L.; Calvert, Orville M.; and Holcombe, Edward L., to Grace, W. R., & Co. Clamp and tensioning means for bag necks and the like. 3,713,267, Cl. 53-112.00b.

Bowers, Harry J., Jr., to General Electric Company. Photoflash lamp arrangement having thermally actuated control. 3,714,407, Cl. 240-1.300.

Bowers, Thomas S. Load holding device improvement. 3,713,616, Cl. 248-361.00r.

Bowman, Lloyd D.: *See—*
Josias, Conrad S.; Bowman, Lloyd D.; and Lovelock, James E., 3,714,421.

Boyer, Alfred N. Velocipede and carrier. 3,713,671, Cl. 280-202.000.

Braak, Edmund C.; and McCarty, Kenneth P., to Hercules Incorporated. Surface coated smokeless propellant charge for caseless ammunition having heat resistant properties. 3,713,916, Cl. 149-12.000.

Bradley, John: *See—*
Chamberlain, James; and Bradley, John, 3,713,346.

Bramley, Anthony. Manufacture of netting. 3,713,761, Cl. 425-104.000.

Brandenburgsky, Mikhail Galileevich: *See—*
Tobak, Lev Zeilikovich; Shterman, Semen Abramovich; Brandenburgsky, Mikhail Galileevich; Lichman, Nikolai Iosifovich; and Lugovskoi, Andrei Lukyanovich, 3,713,198.

Brandino, Dario: *See—*
Michellone, Giancarlo; Maurizio, Gilberto; Calcia, Giuseppe; Brandino, Dario; and Palazzetti, Mario, 3,713,708.

Brauckmann, Johannes. Spindle staircase. 3,713,260, Cl. 52-187.000.

Braunschweigische Maschinenbauanstalt: *See—*
Dietzel, Walter, 3,713,469.

Braunstein, Jerry: *See—*
Romberger, Karl A.; and Braunstein, Jerry, 3,714,014.

Breeden, Kenneth H.: *See—*
Cribbs, John A.; Abeling, Arthur B.; and Breeden, Kenneth H., 3,714,632.

Brian, Joseph M. Pressure sensing device testing means. 3,713,325, Cl. 73-4.00r.

Brickner, Kenneth G., to United States Steel Corporation. Ferritic stainless steels with improved drawability and resistance to ridging. 3,713,812, Cl. 75-126.00b.

Bridgman, Henry. Collection bottle. 3,713,444, Cl. 128-275.000.

Briggin, Edward: *See—*
Katzman, Lawrence; and Briggin, Edward, 3,714,391.
Katzman, Lawrence; and Briggin, Edward, 3,714,392.

Bright, Edward J.; and Fairbairn, Le Roy W., to Bendix Corporation, The. Snap in polarizing member for electrical connectors. 3,714,617, Cl. 339-186.00m.

Brilando, Frank P., to Schwinn Bicycle Company. Air cushion handlebar grip. 3,713,350, Cl. 74-551.900.

Bristol Myers Company: *See—*
Richardson, Elwin J., Jr., 3,714,157.

Bristol-Myers Company: *See—*
Gottstein, William J.; and Cheney, Lee C., 3,714,146.

British Oxygen Company Limited, The: *See—*
Laurenson, Laurence; and Holland, Leslie Arthur, 3,713,754.

Broadbent, Douglas; Turner, Ralph William; and Walton, Peter Leslie, to Imperial Chemical Industries Limited. Enzymes from armillaria mellea. 3,713,981, Cl. 195-62.000.

Brock, Allen J., to Data Card Corporation, mesne. Electro-mechanical read head. 3,714,398, Cl. 235-61.11c.

Bromberg, Louis. Article for smoking. 3,713,451, Cl. 131-9.000.

Brouwer, Frans; Englehardt, William H.; Krempel, Frank M.; and Payne, Robert A., to Stewart-Warner Corporation. Vehicle race monitoring system. 3,714,649, Cl. 343-6.50r.

Brown & Root, Inc.: *See—*
Hyatt, Alfred Ray, 3,713,275.

Brown, Arthur G.: *See—*
Parkinson, Dean B.; and Brown, Arthur G., 3,713,867.

Brown, Dale M.; Engeler, William E.; Gray, Peter V.; and Garfinkel, Marvin, to General Electric Company. Field-effect transistors with self registered gate which acts as diffusion mask during formation. 3,714,525, Cl. 317-235.00r.

Brown, James L., to Mallinckrodt Chemical Works. Method for determining thyroxine in blood serum and reagent therefor. 3,714,344, Cl. 424-1.000.

Brown, Max Murrow, to Deere & Company. Shuttle valve. 3,713,703, Cl. 303-10.000.

Bruning, Harry F., Jr.; and Blowers, William L., to Kollmorgen Corporation. Electronic measuring instrument with digital display scale extension. 3,714,569, Cl. 324-131.000.

Brunsch, Klaus, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Fiber reinforced plastic laminate construction of an airfoil wing type member. 3,713,753, Cl. 416-226.000.

Brunswick Corporation: *See—*
Copeland, Robert L.; Gamble, Bobby G.; Chase, Vance A.; and Beeler, David R. (said Copeland assor. to), 3,713,961.
Roberts, John A.; Roberts, Peter R.; King, Alwyn H.; and Danzey, Lee B., 3,713,202.

Brush Beryllium Company, The: *See—*
Walsh, Kenneth A.; and Sandor, Andrew J., 3,713,810.

Bryant, Tommy L. Apparatus for laying pipe. 3,713,301, Cl. 61-72.600.

Bryson, Neil Burton, to Alcan Research and Development Limited. Direct chill casting of ingots. 3,713,479, Cl. 164-89.000.

Buchan, William R., to Itek Corporation. Integrated electro-optic analyzer. 3,713,723, Cl. 350-150.000.

Buchanan, Russell A.; and Russell, Charles R., to United States of America, Agriculture. Powdered resorcinol-formaldehyde treated polysaccharide-reinforced elastomer masterbatches, compounds, and resulting vulcanized rubbers. 3,714,087, Cl. 260-17.200.

Bucholtz, Glen E.; and Doyle, James N., to Globe Tool and Engineering Company, The. Wire guide apparatus. 3,713,598, Cl. 242-7.05b.

Buckhouse , Norman O.: *See—*
Dankel, Douglas D.; and Buckhouse , Norman O., 3,713,284.

Buckman, Wayne T.: *See—*
Craig, Sam N.; Warner, Ellis R., Jr.; and Buckman, Wayne T., 3,713,595.

Budtolaev, Konstantin Nikolaevich: *See—*
Zarezankov, Georgy Khristovich; Khokhlov, Alexander Semenovich; Cherepnev, Valery Ivanovich; Druzhinin, Nikolai Sergeevich; and Budtolaev, Konstantin Nikolaevich, 3,713,739.

Buendia, Jean: *See—*
Martel, Jacques; and Buendia, Jean, 3,714,153.

Buhrman, Robert P.; and Hensley, Richard D., to Columbia-Great Lakes Corporation. Core assembly. 3,713,601, Cl. 242-68.600.

Bullock, David C.: *See—*

Epstein, David J.; and Bullock, David C., 3,714,633.
Bunker-Ramo Corporation, The: *See—*
Kang, George S., 3,714,566.
Bunten, Theodore M., to Repco Products Corporation. Pedestal for electrical circuit components having a flexible protective dielectric shield. 3,714,369, Cl. 174-38.000.
Bunting, Pamela M.; and Leathen, William W., to Gulf Research & Development Company. Cultivation of micro-organisms on hydrocarbons. 3,713,976, Cl. 195-28.00r.
Bunting, Pamela M.; and Leathen, William W., to Gulf Research & Development Company. Cultivation of micro-organisms on hydrocarbons. 3,713,984, Cl. 195-82.000.
Bur, Philip W., to Honeywell Inc. Limit control apparatus. 3,714,537, Cl. 318-626.000.
Burdelski, Theo; and Gurtner, Klaus, to Burdelski, Theo, & Co., Ferroplast. Coupling. 3,713,306, Cl. 64-14.000.
Burdelski, Theo, & Co., Ferroplast: *See—*
Burdelski, Theo; and Gurtner, Klaus, 3,713,306.
Burkhardt, Joseph A.; Childers, Thomas W.; Tidwell, Danny R.; and Koerner, Roger J., to Esso Production Research Company. Subsea electric connector system and procedure for use. 3,714,384, Cl. 200-51.00r.
Burlington Industries, Inc.: *See—*
Atwell, Everett C.; and Ballard, Homer Lee, 3,713,347.
Burnett, Lauren W.: *See—*
Falk, Joseph H.; and Burnett, Lauren W., 3,713,633.
Burns, Fred R. Combination knockout tool. 3,713,200, Cl. 29-267.000.
Burroughs Corporation: *See—*
Kupsky, George A., 3,714,506.
Burrous, Stanley E.; Eudy, William W.; and Siedler, Arthur J., to Morton-Norwich Products, Inc. Antibacterial composition and method. 3,714,356, Cl. 424-271.000.
Busch, John E.; and Puccini, Sergio E., to GTE Automatic Electric Laboratories, Incorporated. Switching arrangement for controlling peripheral units in a time division multiplex common control system. 3,714,379, Cl. 179-18.00j.
Bushee, Joseph J. Apparatus for controlling flow of pressurized fluids. 3,713,462, Cl. 137-625.210.
Butler, Robert F.: *See—*
Stout, Lilburn G., Jr.; Butler, Robert F.; and Smith, Thomas S., 3,713,391.
Butler-Manufacturing Company: *See—*
Cottrell, Lyle F., 3,713,564.
Butterworth Hydraulic Developments Limited: *See—*
Butterworth, Philip, 3,713,367.
Butterworth, Philip, to Butterworth Hydraulic Developments Limited. Fluid pressure operated motors. 3,713,367, Cl. 91-231.000.
Butzow, Neil W.; and Harris, Bernard, to Rex Chainbelt Inc. Method of making low friction fabric lined nuts of multiple length construction. 3,713,932, Cl. 156-173.000.
Byble, Duane C.: *See—*
Leidy, Harold T.; Kerrigan, Charles M.; and Byble, Duane C., 3,713,837.
Bywater, James W., Jr., 50% to Bywater, Lucille M. Closure member for pipes and the like. 3,713,463, Cl. 138-89.000.
Bywater, Lucille M.: *See—*
Bywater, James W., Jr., 3,713,463.
Cabezudo, Jose Fernandez. Massage envelope belt with adjusting dispositives for vibrators and mobilizers. 3,713,439, Cl. 128-63.000.
Cable, H. Edward; Cable, Herbert E.; and Cable, John A., to Weld Tooling Corporation. Portable flame cutting machine. 3,713,637, Cl. 266-23.00m.
Cable, Herbert E.: *See—*
Cable, H. Edward; Cable, Herbert E.; and Cable, John A., 3,713,637.
Cable, John A.: *See—*
Cable, H. Edward; Cable, Herbert E.; and Cable, John A., 3,713,637.
Cabot Corporation: *See—*
Asgeirsson, Asgeir, 3,714,041.
Berstein, Gregor; Hardy, John F.; and Doppler, Leonard H., 3,714,085.
Cachan, Jean Cospen; and Baumann, Bernard, to Cebal GP. Method and apparatus for hermetically sealing a rigid panel. 3,713,956, Cl. 156-580.000.
Cadiou, Jean Georges, to Societe Anonyme Automobiles Citroen. Car safety belts. 3,713,693, Cl. 297-389.000.
Cahill, William J., Jr., to Consolidated Edison Company of New York, Inc. Emergency shut-off valve for nuclear reactors. 3,713,969, Cl. 176-38.000.
Cal-West Electric Inc.: *See—*
de Bella, Gasper V., 3,714,449.
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, to Societa' Italina Resine S.p.A. Process for preparing vinyl acetate. 3,714,237, Cl. 260-497.00a.
Calcia, Giuseppe: *See—*
Michellone, Giancarlo; Maurizio, Gilberto; Calcia, Giuseppe; Brandino, Dario; and Palazzetti, Mario, 3,713,708.
Calgon Corporation: *See—*
Hoover, Erwin Frederick; and Sinkovitz, Gloria DiMarco, 3,713,859.
Calvert, Orville M.: *See—*
Bowden, Woodrow R., Jr.; Owen, Dave L.; Calvert, Orville M.; and Holcombe, Edward L., 3,713,267.
Campanini, Sergio, to Berg Manufacturing Company, The, mesne. Modualted spring brake. 3,713,702, Cl. 303-9.000.
Campbell, James K.; and Lee, Kenneth M., to Dow Corning Corporation. Silicone-acrylate soil release treatment for organic textiles. 3,714,287, Cl. 260-826.000.
Campbell, James T.: *See—*
Hileman, Ronald E.; and Campbell, James T., 3,714,404.
Camper Improvements Company: *See—*
Hooks, Claud H.; and Hooks, Margaret W., 3,713,687.
Camras, Marvin, to IIT Research Institute. Method of making a transducer head. 3,713,212, Cl. 29-603.000.
Canadian International Paper Company: *See—*
Hoffmann, Wolfgang; and Wick, Paul, 3,713,526.
Canadian Patents and Development Limited: *See—*
Dawson, Peter S. S.; Kurz, Wolfgang G. W.; Anderson, Moffat; and York, Arthur E., 3,713,988.
Kusters, Norbert L.; and Macmartin, Malcolm P., 3,714,567.
Cannon, Donald D.: *See—*
Davis, Francis C.; Cannon, Donald D.; Furman, Francis J., Jr.; and Sease, John D., 3,714,305.
Canoga Controls Corporation: *See—*
Koerner, Ralph J., 3,714,626.
Canon Kabushiki Kaisha: *See—*
Takahashi, Shinkichi, 3,714,531.
Cante, Charles J.: *See—*
Lavo, Harry F.; and Cante, Charles J., 3,713,404.
Capuano, Italo A., to Olin Corporation. Automatic mercury monitor. 3,713,776, Cl. 23-253.00r.
Carborundum Company, The: *See—*
Economy, James; and Clark, Rodger A., 3,714,111.
Carduck, Franz Josef: *See—*
Dorschner, Oskar; Storkebaum, Christoph; Carduck, Franz Josef; and Janfeld, Johannes, 3,713,590.
Cardwell Westinghouse Company: *See—*
Daugherty, David W., Jr., 3,713,546.
Caretta, Renato: *See—*
Bottasso, Franco; Pacciarini, Antonio; and Caretta, Renato, 3,713,929.
Carey, John Gerard: *See—*
Colchester, John Edward; and Carey, John Gerard, 3,714,174.
Carl, George R.: *See—*
United States of America, National Aeronautics and Space Administration, 3,713,480.
Carlsson, Carl Gosta, to AB Cernelle. Process of producing a composition for controlling the bacterial flora in the intestines of animals. 3,713,836, Cl. 99-2.0vm.
Carlstrom, Lawrence A.; and Padgett, George L., to General Electric Company. Predeformed rabbit joint. 3,713,676, Cl. 287-53.00r.
Carman, Robert R.: *See—*
Rottmayer, Earl; Carman, Robert R.; and Gibson, James O., 3,713,959.
Carner, John W.; and Anderson, Frank B., to Anderson, Frank B., mesne. Building construction. 3,714,304, Cl. 264-94.000.
Carpenter, David W.; and Yeakey, Jack A., to United States of America, Navy. Solid propellant. 3,713,395, Cl. 102-103.000.
Carpenter Technology Corporation: *See—*
Philip, Thoni V.; and Vedder, Ralph L., 3,713,905.
Carr, Larry R.; and Topol, George J., to Keene Corporation. Suspended solids analyzer. 3,714,444, Cl. 250-218.000.
Carrier Corporation: *See—*
Pilarczyk, Karol; and Pennink, Hans, 3,713,756.
Carroll, Harlan R., to Fiber Industries, Inc. Textile noise reduction device. 3,713,509, Cl. 181-33.00k.
Carroll, Joseph E.: *See—*
Lillestrand, Robert L.; and Carroll, Joseph E., 3,713,740.
Carrow, Donald J.: *See—*
Verdol, Joseph A.; Ryan, Patrick W.; and Carrow, Donald J., 3,714,110.
Carruthers, John: *See—*
Winsor, John; and Carruthers, John, 3,714,030.
Carson, William S. Shower head. 3,713,587, Cl. 239-383.000.
Carstens, Werner: *See—*
Thomson, Willy; and Carstens, Werner, 3,713,237.
Cartwright, Robert S., to Stewart-Warner Corporation. Wheel stake. 3,713,186, Cl. 16-45.000.
Casad, Burton M.: *See—*
Barrere, Clem A., Jr.; and Casad, Burton M., 3,713,272.
Case, J. I., Company: *See—*
Seaberg, David H.; and Purdy, Paul J., 3,713,557.
Caserio, Frederick F., Jr.: *See—*
Nakaguchi, Glenn M.; Wang, Ting-I.; and Caserio, Frederick F., Jr., 3,714,202.
Cataland, James A. Race calculator. 3,714,399, Cl. 235-114.000.
Caterpillar Tractor Company: *See—*
Haak, Williard J.; and Marsden, Howard A., 3,713,295.
Cautilli, Philip A.; and Makower, Samuel J., to Borden Inc. Process for producing low foaming latexes of interpolymers containing vinyl chloride and ethylene. 3,714,097, Cl. 260-29.6rb.
Cay Products, Inc.: *See—*
McLarty, Shirley, 3,713,678.
Cebal GP: *See—*
Cachan, Jean Cospen; and Baumann, Bernard, 3,713,956.
Cecil, James Barton, to Motorola, Inc. Ladder termination circuit. 3,714,599, Cl. 330-19.000.

Cekada, Joseph, Jr. Aqueous siloxane bag lubricant for tire molding. 3,713,851, Cl. 106-38.220.
Celanese Corporation: *See—*
Honeycutt, James R.; Friday, Thomas F.; and Floyd, Terry S., 3,713,358.
Ramsay, Alston, Jr., 3,713,936.
Cerberus AG: *See—*
Scheidweiler, Andreas, 3,714,641.
Cerda, Elisabeth S.: *See—*
Szmuszkovicz, Jacob; and Cerda, Elisabeth S., 3,714,186.
Chaffers, John W., to Weyerhaeuser Company. Container with means for locking the lid. 3,713,579, Cl. 229-44.00r.
Chamberlain, James; and Bradley, John, to Rotor Electric Company, Limited. Oscillator mechanism for fan. 3,713,346, Cl. 74-42.000.
Champ, Robert B.; Cherry, Albert J.; and Shattuck, Meredith D., to International Business Machines Corporation. Electrophotographic charge transport layer. 3,713,820, Cl. 96-1.500.
Chandra, Grish; Owen, William John; Lloyd, Norman Cecil; and Cooper, Bryan Ewart, to Midland Silicones Limited. Organosilicon compounds. 3,714,118, Cl. 260-46.5ua.
Chang, Yun Feng: *See—*
Labana, Santokh S.; and Chang, Yun Feng, 3,714,120.
Chapman, Carl P.: *See—*
United States of America, National Aeronautics and Space Administration, 3,713,987.
Charewicz, Francis J.; Steele, Eugene K.; and Nichols, Frank S., to General Electric Company. Method of making a sealing gasket. 3,714,318, Cl. 264-236.000.
Charle, Roger; Kalopissis, Gregoire; and Zviak, Charles, to Societe Anonyme dite: L'Oreal. Aerosol stain-removing composition. 3,714,049, Cl. 252-90.000.
Charron, Dwayne W., to Bangor Punta Operations, Inc. Silencer. 3,713,362, Cl. 89-14.00d.
Chase, Vance A.: *See—*
Copeland, Robert L.; Gamble, Bobby G.; Chase, Vance A.; and Beeler, David R., 3,713,961.
Cheers, Ronald M.; and Fisch, Johannes, to Euclid, Inc. Ride cylinder. 3,713,666, Cl. 280-124.00r.
Cheever, Leo H.: *See—*
Williams, Thurston V.; and Cheever, Leo H., 3,713,254.
Chemetron Corporation: *See—*
Stracek, Robert J., 3,714,517.
Chemicals & Phosphates Ltd.: *See—*
Greidinger, Dahlia S.; and Cohen, Liuba, 3,713,801.
Chemie Gruenenthal GmbH: *See—*
Huemer, Heinrich; Herrling, Siegfried; and Muckter, Heinrich, 3,714,206.
Chen, Nai-Keung; and Omohundro, William A., to Sperry Rand Corporation. Adjustable type hair rollers. 3,713,455, Cl. 132-40.000.
Cheney, Lee C.: *See—*
Gottstein, William J.; and Cheney, Lee C., 3,714,146.
Cheng, Ming T.: *See—*
Baldwin, Roger A.; and Cheng, Ming T., 3,714,267.
Chepelev, Viktor Gavrilovich; Grinchenko, Nikolai Nikolaevich; and Goldshein, Jury Moiseevich Goldshein, to Spetsialnoe Proektno-Konstruktorskol i Tekhnilogicheskoe Bjuro Po Elektrobureniju (SKTBE). Insulation tester. 3,714,455, Cl. 307-112.000.
Cherepnev, Valery Ivanovich: *See—*
Zarezankov, Georgy Khristovich; Khokhlov, Alexander Semenovich; Cherepnev, Valery Ivanovich; Druzhinin, Nikolai Sergeevich; and Budtolaev, Konstantin Nikolaevich, 3,713,739.
Cherkasov, Petr Alexeevich; Kuznetsov, Evgeny Mikhailovich; Averin, Vyacheslav Vasilievich; and Samarin, Alexandr Mikhailovich. Method for determining activity of oxygen in liquid and solids metals and alloys. 3,713,995, Cl. 204-1.00t.
Cherry, Albert J.: *See—*
Champ, Robert B.; Cherry, Albert J.; and Shattuck, Meredith D., 3,713,820.
Chesmejef, Stephen: *See—*
Miller, Edward H.; and Chesmejef, Stephen, 3,713,278.
Chevron Research Company: *See—*
Anderson, Robert G., 3,714,076.
Chiaki, Osada: *See—*
Hisatake, Ono; Chiaki, Osada; and Harumi, Katsuyama, 3,714,187.
Chiaro, James S.: *See—*
Chiaro, James S.; and Chiaro, Susan C. (said Chiaro, Susan, assor. to), 3,713,453.
Chiaro, James S.; and Chiaro, Susan C., said Chiaro, Susan, assor. to Chiaro, James S. Apparatus for styling hair. 3,713,453, Cl. 132-9.000.
Chiaro, Susan C.: *See—*
Chiaro, James S.; and Chiaro, Susan C., 3,713,453.
Chiba, Hiroyuki; Masuda, Hideaki; and Hirota, Eiichi, to Matsushita Electric Industrial Co., Ltd. Refractory powder hot-pressing system. 3,713,193, Cl. 25-132.000.
Chicago, Bridge & Iron Company: *See—*
Langmead, Edmund Clarence; and De Wane, Gerald, 3,713,638.
Maher, James Bernard; Delahunty, Terry Wayne; and Patton, Edmond Louis, 3,713,794.
Chiesa, Peter J., Jr.: *See—*
Marks, Burton S.; and Chiesa, Peter J., Jr., 3,714,119.
Chiffert, Alain, to Compteurs Schlumberger. Current transformer connection control. 3,714,545, Cl. 323-6.000.
Chikano, Mitsuo: *See—*
Matsuura, Takashi; and Chikano, Mitsuo, 3,714,055.
Childers, Thomas W.: *See—*
Burkhardt, Joseph A.; Childers, Thomas W.; Tidwell, Danny R.; and Koerner, Roger J., 3,714,384.
Childress, Scott J.: *See—*
Bell, Stanley C.; and Childress, Scott J., 3,714,145.
Christensen, Arthur C., to Scovill Manufacturing Company. Kitchen blender having self-aligning drive means. 3,713,628, Cl. 259-108.000.
Christmas, Mr., Incorporated: *See—*
Hermanson, Terry, 3,713,957.
Chromalloy American Corporation: *See—*
Prill, Arnold L.; and Tarkan, Stuart E., 3,713,788.
Chrysler United Kingdom Limited: *See—*
Lewis, David, 3,713,574.
Chupka, David E.: *See—*
Blakley, Earl T.; Chupka, David E.; Harbron, Donald L., Jr.; Marsh, Paul G.; and Seifert, Peter, 3,713,594.
Chupp, John P., to Monsanto Company. Herbicidal N-(1-cycloalken-1-yl)-amino-S-triazine compounds. 3,714,162, Cl. 260-249.800.
Chvertko, Anatoly Ivanovich: *See—*
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,714,368.
Ciba-Geigy AG: *See—*
Metzger, Karl; and Scheuzger, Karl, 3,714,198.
Moergeli, Eduard, 3,714,205.
Wegmuller, Hans; and Keller, Karlheinz, 3,713,768.
Zondler, Helmut; and Pfleiderer, Wolfgang, 3,714,196.
Ciba-Geigy Corporation: *See—*
Beal, Walter; Hobday, Cyril; Jack, James; and Keenan, John Francis Edmund, 3,713,769.
Bencze, William Laszlo, 3,714,360.
Gubler, Kurt, 3,714,351.
Priola, Michael Anthony, 3,713,806.
Schlapfer, Hans, 3,714,152.
Spivack, John D., 3,714,300.
Sturm, Elmar; and Vogel, Christian, 3,714,217.
Ciecior, Heinrich, to Singer Company, The. Needle bar mechanism for sewing machines. 3,713,407, Cl. 112-221.000.
Cincinnati Milacron Inc.: *See—*
Albrecht, George O.; and Nead, Thomas E., 3,714,538.
Cintron, Rene: *See—*
Sosin, Frank H.; and Cintron, Rene, 3,714,643.
Cir, Yaroslav: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.
Cities Service Company: *See—*
Barker, James E., 3,714,330.
Eckert, Frank J., 3,713,858.
Olechowski, Jerome Robert, 3,714,134.
Olechowski, Jerome Robert, 3,714,255.
Roth, Shirley H.; Green, Joseph; and Seipel, John J., 3,714,081.
Roth, Shirley H.; Green, Joseph; and Seipel, John J., 3,714,082.
Cities Service Oil Company: *See—*
Rhoades, Vaughan W., 3,713,698.
Clark, Frank S., to Monsanto Company. Polyphenyl thioether lubricating compositions. 3,714,043, Cl. 252-46.700.
Clark, Kenneth G.; Cook, Thomas J.; De Pass, Ernest T.; and Manfredonia, Abraham, to Union Camp Corporation. Honeycomb making machine. 3,713,954, Cl. 156-548.000.
Clark, Rodger A.: *See—*
Economy, James; and Clark, Rodger A., 3,714,111.
Clarke, Roderick Hope, to Decca Limited. Sealed housings for electronic or electrical equipment. 3,714,406, Cl. 240-1.0el.
Claude, Gueremy; Robert, Labey; and Roger, Thevenot, to Societe Generale de Recherches d'Applications Scientifiques "Sogeras". Pharmaceutical compositions comprising quinuclidinol derivatives. 3,714,357, Cl. 424-267.000.
Clay, Robert B.: *See—*
Cook, Melvin A.; Clay, Robert B.; and Udy, Lex L., 3,713,917.
Clemence, Francois; and Le Martret, Odile, to Roussel-UCLAF. B-(Theophylline ethyl) monosulfite. 3,714,163, Cl. 260-253.000.
Clemens, Anton Hubert, to Miles Laboratories, Inc. Specific gravity apparatus. 3,713,327, Cl. 73-32.000.
Clements, Patricia C.: *See—*
De Brunner, Ralph E.; and Clements, Patricia C., 3,713,882.
Clements, William Lamar: *See—*
Thompson, Larry O.; Gilbert, William J.; Thompson, Louis R.; Martin, James W., Jr.; and Clements, William Lamar, 3,713,554.
Clemetson, Warren Jay; and Kurokawa, Kaneyuki, to Bell Telephone Laboratories, Incorporated. Exclusive or circuit. 3,714,460, Cl. 307-216.000.
Cline, Edward T., to Du Pont de Nemours E. I., and Company. Chemiluminescent composition containing surfactant. 3,714,054, Cl. 252-188.300.
Close, Ernest Frederick, to Magnavox Company, The. Electronic search tuning system. 3,714,580, Cl. 325-470.000.

Clough, Roy L., Jr., to Xodar Corporation. Aquatic toy. 3,713,250, Cl. 46-92.000.

Clowers, Earl R.; and Azelkas, Walter G., to Singer Company, The. Vacuum cleaner with nozzle height adjusting mechanism. 3,713,185, Cl. 15-354.000.

Clyde Corporation: *See—*
Ginther, Gary D., 3,713,527.

Coast, Geoffrey; Prince, Kenneth; Spruce, Brian; and Morgan, Vernon, to United Kingdom Atomic Energy Authority. Nuclear reactor power plant. 3,713,972, Cl. 176-60.000.

Cobb, James Edward: *See—*
West, Dexter F.; and West, Joseph W., 3,713,378.

Cobbledick, David S.; and Norman, Arthur J., to General Tire & Rubber Company, The. Urethane foam catalyst system. 3,714,077, Cl. 260-2.5be.

Cochran, William H., II. Antistatic tufted product. 3,713,960, Cl. 161-66.000.

Codlin, James B., to Allis-Chalmers Manufacturing Company. Ripper plow with combustion chamber in tip to effect fracturing of soil. 3,713,496, Cl. 172-699.000.

Codman & Shurtleff, Inc.: *See—*
Reimels, Harry G., 3,713,533.

Coffee, Ralph E., to Olin Mathieson Chemical Corporation. Method of treating spherical powder grains. 3,714,306, Cl. 264-3.00d.

Coffee, Robert L. Method and apparatus for storing gases and fueling internal combustion engines. 3,713,273, Cl. 55-75.000.

Cognos Corporation: *See—*
Rosen, Alfred H.; and Smith, Lester C., 3,714,372.

Cohen, Liuba: *See—*
Greidinger, Dahlia S.; and Cohen, Liuba, 3,713,801.

Colchester, John Edward; and Carey, John Gerard, to Imperial Chemical Industries Limited. Manufacture of bipyridylium salts. 3,714,174, Cl. 260-295.0am.

Cole, Byron M. Cathode ray tube deflection system. 3,714,497, Cl. 315-19.000.

Coleman Company, Inc., The: *See—*
Worley, Lauren D., 3,713,681.

Coleman, Donald F.; and Miller, Robert G., to Production Technology Inc., mesne. Inertia welder speed control device. 3,714,509, Cl. 317-5.000.

Coley, Kenneth R., to Westinghouse Electric Corporation. Detachable meter mounting. 3,714,615, Cl. 339-112.000.

Colgate-Palmolive Company: *See—*
Gray, Frederick William, 3,714,050.
Inamorato, Jack Thomas, 3,714,074.
Judd, Claude I., 3,714,225.
Milesi, Domenico; and Natali, Remigo, 3,714,051.
Suh, John T., 3,714,193.

Colius, Helmut Gustav, to Mannix Co., Ltd. Single turntable apparatus for positioning railroad ties. 3,713,396, Cl. 104-9.000.

Collins Radio Company: *See—*
Stover, Harris A., 3,714,375.
Williford, Jerry G., 3,714,603.

Colorado Springs National Bank: *See—*
Lundin, Charles E., 3,713,813.

Colt Industries Operating Corporation: *See—*
Zaid, Melvin, 3,713,386.

Columbia Broadcasting System, Inc.: *See—*
Grosso, Patrick F.; Rutherford, Robert E., Jr.; and Sargent, Donald E., 3,714,011.

Columbia-Great Lakes Corporation: *See—*
Buhrman, Robert P.; and Hensley, Richard D., 3,713,601.

Comex-Equipment: *See—*
Bordessoule, Rene F.; Kermabon, Andre J.; and De Vera, Serge, 3,713,411.

Commissariat a l'Energie Atomique: *See—*
Normand, Georges; and Venobre, Henri, 3,713,973.

Compagnie Francaise des Petroles: *See—*
Bordessoule, Rene F.; Kermabon, Andre J.; and De Vera, Serge, 3,713,411.

Compco Corporation: *See—*
Patton, Thomas Henry, 3,713,602.

Compteurs Schlumberger: *See—*
Chiffert, Alain, 3,714,545.

Conklin, Alvin R. Combination shower and toiletry dispenser. 3,713,585, Cl. 239-307.000.

Conrad, Rene; and Hohmann, John, to Dynaloc Corporation. Centerline tracking rollers for closed loop systems. 3,713,348, Cl. 74-240.000.

Consolidated Edison Company of New York, Inc.: *See—*
Cahill, William J., Jr., 3,713,969.

Consolloy, James W., to ESB Incorporated. Multicell battery having membrane sealed between cover and container. 3,713,895, Cl. 136-114.000.

Consulab Inc.: *See—*
Delisle, Jules; Deschenes, Pierre A.; and Leroux, Adrien, 3,714,453.

Continental Can Company, Inc.: *See—*
Winkless, Robert A., 3,713,862.

Continental Oil Company: *See—*
Barrere, Clem A., Jr.; and Casad, Burton M., 3,713,272.
Riggs, Olen L., Jr.; and Barnett, David W., 3,714,004.
Waters, Kenneth H., 3,714,621.

Control Data Corporation, mesne: *See—*
Lillestrand, Robert L.; and Carroll, Joseph E., 3,713,740.

Conwed Corporation: *See—*
Gaffney, Bernard J.; and Gaffney, Robert Lee, 3,714,310.

Cook, Charles F., to Phillips Petroleum Company. Low temperature polymerization of cyclicpolyenes. 3,714,138, Cl. 260-93.100.

Cook, Jay E. Ball throwing and receiving system. 3,713,658, Cl. 273-26.00d.

Cook, Melvin A.; Clay, Robert B.; and Udy, Lex L., to Ireco Chemicals. Blasting slurry compositions containing calcium nitrate and method of preparation. 3,713,917, Cl. 149-20.000.

Cook, Melvin Alonzo; and Bailey, Donald T., to Ireco Chemicals. Stiff aqueous explosive composition containing gilsonite. 3,713,914, Cl. 149-2.000.

Cook, Thomas J.: *See—*
Clark, Kenneth G.; Cook, Thomas J.; De Pass, Ernest T.; and Manfredonia, Abraham, 3,713,954.

Cooke Engineering Company, The: *See—*
Leverich, Charles T., 3,714,385.

Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., to United States of America, Navy. Difluoroamino compounds. 3,714,254, Cl. 260-564.00r.

Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., to United States of America, Navy, mesne. 4,4-Bis (difluoramino)-1,7-difluoro-1,1,7,7-tetranitroheptane. 3,714,260, Cl. 260-583.0nh.

Coon, Clifford L.; and Hill, Marion E., to Stanford Research Institute. Nitration with nitric acid and trifluoromethanesulfonic acid. 3,714,272, Cl. 260-645.000.

Cooper, Bryan Ewart: *See—*
Chandra, Grish; Owen, William John; Lloyd, Norman Cecil; and Cooper, Bryan Ewart, 3,714,118.

Cooper, Douglas J.: *See—*
Thompson, C. Ames; and Cooper, Douglas J., 3,713,539.

Cooper, Julius; and Moe, Walter, to Ideal Toy Corporation. Box with preformed nail receiving apertures. 3,713,656, Cl. 273-135.00r.

Copeland, Robert L.; Gamble, Bobby G.; Chase, Vance A.; and Beeler, David R., said Copeland assor. to Brunswick Corporation. Dielectric wall. 3,713,961, Cl. 161-93.000.

Cordes, Linus F.: *See—*
Engeler, William E.; and Cordes, Linus F., 3,714,520.

Cornelius Company, The: *See—*
Estrem, Malcolm J., 3,713,522.

Cornell Aeronautical Laboratory, Inc.: *See—*
Reinnagel, Richard E., 3,714,564.

Corning Glass Works: *See—*
Beall, George H., 3,713,854.

Cortesi, Roger S.: *See—*
Goetz, Allan C.; Cortesi, Roger S.; and Hauck, Lester A., 3,713,742.

Corti, Giuseppe: *See—*
Levrini, Tullio; and Corti, Giuseppe, 3,713,930.

Cosp, Enrique A. Toy and delayed release propelling mechanism therefor. 3,713,514, Cl. 185-37.000.

Costello, Thomas V.: *See—*
Biren, Steven; and Costello, Thomas V., 3,714,620.

Cottrell, Lyle F., to Butler-Manufacturing Company. Method and means for facilitating the flow of granular materials. 3,713,564, Cl. 222-1.000.

Coulter Electronics, Inc.: *See—*
Coulter, Wallace H.; and Hogg, Walter R., 3,714,565.

Coulter, Wallace H.; and Hogg, Walter R., to Coulter Electronics, Inc. Electronic particle analyzing apparatus with improved aperture tube. 3,714,565, Cl. 324-71.0cp.

Cowpland, Michael C. J.; and Dickinson, David J., to Microsystems International Limited. Thin film capacitor. 3,714,529, Cl. 317-261.000.

Cox Michael Henry: *See—*
Deeks, Leslie Roy; and Cox Michael Henry, 3,713,408.

Craft, Jack, to RCA Corporation. Muting circuit. 3,714,583, Cl. 325-348.000.

Craig, Dwin R., to Symbionics, Inc. Microscopic optical comparison device. 3,713,720, Cl. 350-30.000.

Craig, Dwin R., to Dynatronics, Inc., mesne. Anti-glare light box. 3,714,413, Cl. 240-9.500.

Craig, Sam N.; Warner, Ellis R., Jr.; and Buckman, Wayne T., to Wascon Systems, Inc. Pulping apparatus. 3,713,595, Cl. 241-46.110.

Crane, Edward J., to International Gari-Systems, Inc. Poultry picker. 3,713,352, Cl. 74-665.60b.

Crane, Hewitt D.; Pressman, Gerald L.; and Eilers, George J., to Electroprint, Inc. Apparatus for forming a positive electrostatic image. 3,713,734, Cl. 355-3.000.

Cranston, Benjamin Howell, to Western Electric Company Incorporated. Explosive bonding of workpieces. 3,713,213, Cl. 29-620.000.

Creaser, George E.: *See—*
Mort, Robert E.; and Creaser, George E., 3,713,381.

Creasy, James R.: *See—*
Ammann, Robert W.; Creasy, James R.; and Dorenbos, David O., 3,714,403.

Crescenzo, Frank G.; Gey, William A.; and Wiebke, Armin T., to United States of America, Navy. Dispersal technique for CW/BW agents. 3,713,383, Cl. 102-6.000.

Cribbs, John A., to Data Card Corporation, mesne. Character recognition method and system with leading/trailing edge control. 3,714,630, Cl. 340-146.30j.

Cribbs, John A.; Abeling, Arthur B.; and Breeden, Kenneth H., to Data Card Corporation, mesne. Character recognition method and system with strobe control. 3,714,632, Cl. 340-146.3wd.
Croce, Louis J.; and Barone, Bruno J., to Petro-Tex Chemical Corporation. Promotion of the oxidation of mononuclear aromatic compounds. 3,714,243, Cl. 260-523.00a.
Cronan, John J., to United Aircraft Corporation. Light weight, low torque, inexpensive drum type optical digital shaft angle encoder. 3,714,448, Cl. 250-231.0se.
Cronstedt, Val, to Avco Corporation. Rolling contact bearing accelerator. 3,713,711, Cl. 308-187.000.
Cross River Products, Inc.: *See—*
Sloan, James, 3,713,568.
Crow, Rufus C., Jr.; and Runions, Adrian C., to Eastman Kodak Company. Apparatus and method for packaging flanged reels. 3,713,266, Cl. 53-26.000.
Crucible Inc.: *See—*
Almasi, Gabriel Charles; and Slusarczyk, William, 3,714,037.
Crump, Robert O., to Honeywell Information Systems, Inc. Pin insertion head. 3,713,197, Cl. 29-203.00b.
Culberston, Billy M., to Ashland Oil & Refining Company. Polymers with recurring imidazole segments. 3,714,129, Cl. 260-78.0tf.
Culp, Jere S.: *See—*
Bogdan, Louis J.; and Culp, Jere S., 3,713,617.
Cunningham, Tim; and McCleerey, Earl W., to Westinghouse Electric Corporation. Hair dryer. 3,713,227, Cl. 34-99.000.
Curelop, Edward J.; and Marincic, Nikola, to Mallory, P. R., & Co., Inc. Chloride free leaching process for porous zinc anodes. 3,713,891, Cl. 136-30.000.
Curtis, Edgar V.; and Curtis, Mildred J. Folding multiposition loading ramp for trucks, having tail gates. 3,713,553, Cl. 214-85.000.
Curtis, Mildred J.: *See—*
Curtis, Edgar V.; and Curtis, Mildred J., 3,713,553.
Custom Machine, Inc.: *See—*
Wloszek, Joseph T., 3,713,555.
Cutler, Leonard S., to Hewlett-Packard Company. Acousto-optic method and apparatus for mode decoupling a ring laser. 3,714,607, Cl. 332-7.510.
Cutting Room Appliances Corporation: *See—*
Paterson, Stephen, 3,713,642.
Cyba, Henryk A., to Universal Oil Products Company. Selective oxidation of alkyl aromatic compounds. 3,714,263, Cl. 260-592.000.
Czernik, Daniel E.: *See—*
McDowell, Donald J.; and Czernik, Daniel E., 3,713,368.
Daenen, Robert; and Swett, James B., to Dart Industries, Inc. Egg cup. 3,713,528, Cl. 206-1.000.
Dahill, Robert T., Jr., to Givaudan Corporation. Myrcene-methacrylonitrile adduct. 3,714,220, Cl. 260-464.000.
Dahm, Manfred; Kraft, Karl-Josef; and Roegler, Manfred, to Farbenfabriken Bayer Aktiengesellschaft. Polyurethane foam resin stabilizers. 3,714,080, Cl. 260-2.5ah.
Dai Nihon Bungu Kabushiki Kaisha; a/t/a Japan Stationery Co., Ltd., The: *See—*
Horie, Yukio, 3,713,745.
Daiichi Seiyaku Co., Ltd.: *See—*
Dohmori, Renzo; Kadoya, Shizuo; Takamura, Isao; Oshima, Yasuo; and Naito, Takeo, 3,714,170.
Dale Products, Inc.: *See—*
Simonton, Robert D., 3,713,571.
Daniel Industries, Inc.: *See—*
Stroman, Larry J., 3,713,337.
Daniels, Archer, Midland Company: *See—*
Pour-El, Akiva; and Swenson, Thomas C., 3,713,843.
Dankel, Douglas D.; and Buckhouse , Norman O., to Roper Corporation. Sweeper for garden tractor having improved hitch linkage. 3,713,284, Cl. 56-364.000.
Danly, James C., to Danly Machine Corporation. Milling cutter for machining ships propellers and the like. 3,713,194, Cl. 29-103.00a.
Danly Machine Corporation: *See—*
Danly, James C., 3,713,194.
Danzey, Lee B.: *See—*
Roberts, John A.; Roberts, Peter R.; King, Alwyn H.; and Danzey, Lee B., 3,713,202.
Dare, Sherman E.; Haas, Davey S.; Herold, Stanley J.; Norris, Steven R.; Patterson, Terry V.; and Sloan, Robert E., to United States of America, Navy. Smoke signal device. 3,713,394, Cl. 102-90.000.
Dart Industries, Inc.: *See—*
Daenen, Robert; and Swett, James B., 3,713,528.
Lancy, Leslie E.; and Wittmann, Ivan E., 3,714,039.
Dashnier, Merwin J.; and Diring, James A., to Alwin Manufacturing Company, Inc. Paper towel dispenser. 3,713,569, Cl. 225-21.000.
Data Card Corporation, mesne: *See—*
Brock, Allen J., 3,714,398.
Cribbs, John A., 3,714,630.
Cribbs, John A.; Abeling, Arthur B.; and Breeden, Kenneth H., 3,714,632.
Deschenes, Raymond J., 3,714,631.
Daugherty, David W., Jr., to Cardwell Westinghouse Company. Cushioning arrangement for railroad cars. 3,713,546, Cl. 213-43.000.
Davidson, Edwin J., to Thiem Corporation. Wedge arrangement for a hot top. 3,713,621, Cl. 249-106.000.
Davidson, Henry, to Gillette Company, The. Method for manufacturing porous point tip. 3,714,314, Cl. 264-137.000.
Davidson, Roger; and Sako, Fumio F., to FMC Corporation. Apparatus for treating waste materials. 3,713,540, Cl. 210-391.000.
Davis, Benjamin; and Phillips, Gordon Hanley, to Glaxo Laboratories Limited. Method of inducing anaesthesia. 3,714,352, Cl. 424-243.000.
Davis, Charles M.: *See—*
Finvold, Rodger C.; and Davis, Charles M., 3,714,430.
Davis, Francis C.; Cannon, Donald D.; Furman, Francis J., Jr.; and Sease, John D., to United States of America, Atomic Energy Commission. Fabrication of bonded-particle nuclear fuel sticks. 3,714,305, Cl. 264-.500.
Davis, Ralph A.; and Allswede, Keith A., to Dow Chemical Company, The. Regeneration of activated charcoal catalyst used in sulfuryl fluoride production. 3,714,336, Cl. 23-203.00r.
Dawson, Peter S. S.; Kurz, Wolfgang G. W.; Anderson, Moffat; and York, Arthur E., to Canadian Patents and Development Limited. Non-ramified cIture growing apparatus. 3,713,988, Cl. 195-143.000.
de Bella, Gasper V., to Cal-West Electric Inc. Portable engine-generator power unit with cooling. 3,714,449, Cl. 290-1.000.
De Brunner, Ralph E.; and Clements, Patricia C. Method of protecting carbonaceous material from oxidation at high temperature. 3,713,882, Cl. 117-169.00r.
de Laune, Jon M., to Motorola, Inc. Digital frequency and/or phase detector charge pump. 3,714,463, Cl. 307-232.000.
De Mania, Dominio; Shartrand, Allan C.; and Barton, Sterling C., to General Electric Company. Gas cooled dynamoelectric machine. 3,714,478, Cl. 310-55.000.
De Pass, Ernest T.: *See—*
Clark, Kenneth G.; Cook, Thomas J.; De Pass, Ernest T.; and Manfredonia, Abraham, 3,713,954.
de Radzitzky d'Ostrowick, Pierre Marie Joseph Ghislain; and de Roocker, Alain Joseph Guillaume, to Labofina, Soc. An. N,N-Dialkyl substituted ethoxymethylene ammonium halides and method. 3,714,215, Cl. 260-453.00r.
de Roocker, Alain Joseph Guillaume: *See—*
de Radzitzky d'Ostrowick, Pierre Marie Joseph Ghislain; and de Roocker, Alain Joseph Guillaume, 3,714,215.
De Vera, Serge: *See—*
Bordessoule, Rene F.; Kermabon, Andre J.; and De Vera, Serge, 3,713,411.
De Vries, Adrian J.: *See—*
Adler, Robert; De Vries, Adrian J.; and Dias, Eleming, 3,714,594.
De Wane, Gerald: *See—*
Langmead, Edmund Clarence; and De Wane, Gerald, 3,713,638.
Deboo, Gordon J.; and Hedlund, Roger C., to United States of America, National Aeronautics and Space Administration. Self-tuning bandpass filter. 3,714,588, Cl. 328-167.000.
Decca Limited: *See—*
Clarke, Roderick Hope, 3,714,406.
Dedieu, Guy; and Dufour, Claude. Composition with adrenolytic action for use in therapy. 3,714,359, Cl. 424-311.000.
Deeks, Leslie Roy; and Cox Michael Henry, to Detexomat Limited. Seaming textile articles. 3,713,408, Cl. 112-121.150.
Deere & Company: *See—*
Brown, Max Murrow, 3,713,703.
Pierrot, Victor Charles, III, 3,713,467.
Deering Milliken Research Corporation: *See—*
Thomas, Manuel A., 3,713,878.
Delahunty, Terry Wayne: *See—*
Maher, James Bernard; Delahunty, Terry Wayne; and Patton, Edmond Louis, 3,713,794.
Delamare, Guy Robert: *See—*
Bertin, Jean Henri; Berthelot, Maurice Paul; and Delamare, Guy Robert, 3,713,507.
Delaney, John J.; and Gervais, Henry O., to Northeastern Pennsylvania Research and Development Co., Inc. Dual powered vehicle. 3,713,502, Cl. 180-27.000.
Delcron Products, Inc.: *See—*
D'Elia, Anthony N.; and Stolarz, Edward M., 3,713,452.
Delente, Jacques J.; Lueckerath, Elmer W.; Akin, Cavit; and Krabbe, Erik, to Krabbe, Erik, mesne. Fermentation process. 3,713,839, Cl. 99-31.000.
D'Elia, Anthony N.; and Stolarz, Edward M., to Delcron Products, Inc. Smoking device with controllable air admitting means. 3,713,452, Cl. 131-198.00a.
Delisle, Jules; Deschenes, Pierre A.; and Leroux, Adrien, to Consulab Inc. Load regulating system. 3,714,453, Cl. 307-39.000.
Delmas, Robert: *See—*
Foex, Marc; Delmas, Robert; and Bonet, Claude, 3,714,390.
Delta Products, Inc.: *See—*
Schweitzer, John C.; and Junak, Edward M., 3,714,507.
Deml, Reinhold: *See—*
Bestenreiner, Friedrich; Deml, Reinhold; Kubitzek, Alfred; and Borowski, Kurt, 3,714,435.
Denenberg, Jeffrey N.; and Padgett, William J., to Warwick Electronics, Inc. Demodulator using a phase locked loop. 3,714,595, Cl. 329-122.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadawaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 3,714,296.
Denman, Robert R.: *See—*
Austin, Lewis M.; Denman, Robert R.; O'Donnell, Thomas P.; and Veres, Frank, 3,713,728.

Dennis, Herman W.; and Birko, Arnold, to Essex International, Inc. Method of manufacture of printed circuits by die stamping. 3,713,944, Cl. 156-261.000.

Derc, Roman, to International Computers Limited. Document handling apparatus. 3,713,646, Cl. 271-57.000.

Derman, Karl Gustav Einar; and Malmstrom, Sven-Erik, to Forsheda Gummifabrik Aktiebolag. Seal for relatively rotatable parts. 3,713,659, Cl. 277-95.000.

Derner, William J.; Stewart, Harold E.; Root, Lawrence E.; and Goodelle, Roger A., to Rollway Bearing Company, Inc. Hollow ended bearing roller. 3,713,712, Cl. 308-215.000.

Deschenes, Pierre A.: *See—*
Delisle, Jules; Deschenes, Pierre A.; and Leroux, Adrien, 3,714,453.

Deschenes, Raymond J., to Data Card Corporation, mesne. Character recognition method and system. 3,714,631, Cl. 340-146.3wd.

Desgrandchamps, Guy; Hemmer, Henri; and Haurie, Michel, to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine. Propylene dimerization process. 3,714,286, Cl. 260-683.15d.

Design Elements, Inc.: *See—*
Mason, Edwin E.; and Libby, Ross C., 3,714,549.

Design Products, inc.: *See—*
Beavers, Jack L., 3,713,257.

Dessau, Maurice S., Co., Inc.: *See—*
LeBaron, Chester A., 3,713,431.

Detexomat Limited: *See—*
Deeks, Leslie Roy; and Cox Michael Henry, 3,713,408.

Detterbeck, Heinrich, to Siemens-Electrogerate GmbH. Household appliance such as cooking stove or the like having ballast means. 3,713,719, Cl. 312-352.000.

Deutsch Company Electronic Components Division, The: *See—*
Fischer, Milton G., 3,713,322.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Kabisch, Gerhard, 3,714,342.
Lussling, Theodor; Theissen, Ferdinand; and Wolfgang, Offenbach, 3,714,251.
Pfleger, Hans; Bittner, Friedrich; and Meffert, Paul, 3,714,331.

Dever, James L.; and Hodan, James John, to Borg-Warner Corporation, mesne. Preparation of neoalkyl phenyl phosphite. 3,714,302, Cl. 260-976.000.

Dewar, Robert Alfred; and Walliczek, Erwin Gunther, to Imperial Chemical Industries of Australia and New Zealand Limited. Process for the production and recovery of lead sulphate. 3,714,341, Cl. 423-559.000.

Di Luca, Henry: *See—*
Fulton, Thomas Philip; and Di Luca, Henry, 3,713,886.

Diamond Shamrock Corporation: *See—*
Beckers, Norman L., 3,714,052.

Diamond Squared Industries, Inc.: *See—*
Vickery, Earl C., 3,714,334.

Dias, Eleming: *See—*
Adler, Robert; De Vries, Adrian J.; and Dias, Eleming, 3,714,594.

Dickensheets, Carlton O.; and Steizer, James G., to Globe Tool and Engineering Company, The. Piece part supply mechanism. 3,713,563, Cl. 221-205.000.

Dickinson, David J.: *See—*
Cowpland, Michael C. J.; and Dickinson, David J., 3,714,529.

Dickstein, Jack: *See—*
Stehle, Peter Fallon; Wu, Chan K.; Loshaek, Samuel; and Dickstein, Jack, 3,714,105.

Diebold, James L.: *See—*
Wolf, Milton; and Diebold, James L., 3,714,093.

Diebold, James L.; and Wolf, Milton, to American Home Products Corporation. 2-Amidinohydrazono-glyoxylanilide derivatives. 3,714,253, Cl. 260-562.00n.

Dieckmann, Ralf E. Striker assembly for firearms. 3,713,241, Cl. 42-69.00b.

Dieterich, Dieter: *See—*
Reischl, Artur; and Dieterich, Dieter, 3,714,095.

Dietzel, Walter, to Braunschweigische Maschinenbauanstalt. Apparatus for preparing sugar cane. 3,713,469, Cl. 241-200.000.

Digital General Corporation: *See—*
Walker, Jerome F., 3,714,571.

Dijkstra, Homme, to U.S. Philips Corporation. Brush construction for a small electrodynamic machine. 3,714,481, Cl. 310-244.000.

Dillman, Ned E.; Gillund, Arden G.; Muth, Victor O.; and Recupito, Pasquale, to General Motors Corporation. Vehicle inflatable cushion actuation and monitoring circuit. 3,714,627, Cl. 340-52.00h.

Dinger, Leon Joel, to AMP Incorporated. Closure device for flexible tubing. 3,713,622, Cl. 251-10.000.

Dingwall, Andrew Gordon Francis; and Jorgensen, John Mulliner, to RCA Corporation. Circuit for improving operation of semiconductor memory. 3,714,638, Cl. 340-173.00r.

Dinter, Herbert. Method of and machine for applying adhesive labels to packages. 3,713,949, Cl. 156-363.000.

Diring, James A.: *See—*
Dashnier, Merwin J.; and Diring, James A., 3,713,569.

Dirks Electronics Corporation: *See—*
Dirks, Gerhard, 3,714,634.

Dirks, Gerhard, to Dirks Electronics Corporation. Method and system for sorting without comparator. 3,714,634, Cl. 340-172.500.

Dislich, Helmut: *See—*
Geffcken, Walter; Paquet, Volker; Dislich, Helmut; Dutz, Hubert; and Mulfinger, Hans-Otto, 3,713,869.

Divelbiss, Hubert N.: *See—*
Taylor, Billy W.; and Divelbiss, Hubert N., 3,713,771.

Diversified Industries, Inc.; d/b/a Scullin Steel Company: *See—*
Wallace, George O., 3,713,710.

Divo, Claudio: *See—*
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,714,237.

Dixon, William D., to Monsanto Company. Imidoylbenzenesulfonamides. 3,714,247, Cl. 260-556.0ar.

Dobrozrakova, Natalia Ivanovna: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.

Dodson, Arthur Edward, to Bell Canada-Northern Electric Research Limited. Generation of multilevel digital waveforms. 3,714,461, Cl. 307-227.000.

Dohmori,. Renzo; Kadoya, Shizuo; Takamura, Isao; Oshima, Yasuo; and Naito, Takeo, to Daiichi Seiyaku Co., Ltd. 2-Substituted or non-substituted-non-thiazolo [5,4-f] quinaline-8-carboxylates compounds and their method of preparation. 3,714,170, Cl. 260-283.0s.

Dolci, Gioacchino,; and Renzoni, Ruggero, to Snam Progetti S.p.A. Method of removing carbon from nuclear fuel elements in a closed system. 3,714,323, Cl. 423-4.000.

Dominion Auto Accessories Limited: *See—*
Magi, Hugo, 3,713,726.

Donaldson Company, Inc.: *See—*
Keller, Darryl E.; and Monson, Donald R., 3,713,280.

Donnelly, Donald E.; and Krump, Robert C., to Emerson Electric Co. Oil burner control system. 3,713,766, Cl. 431-69.000.

Doppler, Leonard H.: *See—*
Berstein, Gregor; Hardy, John F.; and Doppler, Leonard H., 3,714,085.

Dorenbos, David O.: *See—*
Ammann, Robert W.; Creasy, James R.; and Dorenbos, David O., 3,714,403.

Dorman, Isidore: *See—*
Engelstein, Stanley; and Dorman, Isidore, 3,713,535.

Dorschner, Oskar; Storkebaum, Christoph; Carduck, Franz Josef; and Janfeld, Johannes, to Metallgesellschaft Aktiengesellschaft. Apparatus for spreading filaments. 3,713,590, Cl. 239-597.000.

Dorsey, Geoffrey A., Jr., to Kaiser Aluminum & Chemical Corporation. Integral color anodizing of aluminum. 3,714,000, Cl. 204-58.000.

Dorsey, Geoffrey A., Jr., to Kaiser Aluminum & Chemical Corporation. Method for forming anodic oxide coatings having improved adhesive properties. 3,714,001, Cl. 204-58.000.

Dotani, Satoshi: *See—*
Akiyama, Toyomi; Kondo, Mitsuru; and Dotani, Satoshi, 3,713,881.

Doumas, George C. Cigarette package with a self-contained packet of matches. 3,713,531, Cl. 260-48.000.

Dow Chemical Company: *See—*
Larsen, Eric R.; McKendry, Lennon H.; and Edamura, Fred Y., 3,714,233.

Dow Chemical Company, The: *See—*
Davis, Ralph A.; and Allswede, Keith A., 3,714,336.
Kobel, Erwin H.; and Smith, Harry A., 3,714,121.
Strycker, Stanley J., 3,714,160.
Widiger, Almar T.; and Kreh, Marvin J., 3,713,965.

Dow Chemical Corporation: *See—*
Kim, Yung Ki, 3,714,044.

Dow Corning Corporation: *See—*
Campbell, James K.; and Lee, Kenneth M., 3,714,287.
Lamont, Peter, 3,714,204.
Matherly, James E.; and Hays, William R., 3,714,109.
Pierce, Ogden R.; and Greenwald, John R., 3,714,275.
Pierce, Ogden R.; and Greenwald, John R., 3,714,276.
Skobel, Max, 3,713,627.

Downs, Ronald O.; Engelbrecht, Robert M.; deceased (by Engelbrecht, Alice M.; executrix); Hill, James C.; and Moore, Richard N., to Monsanto Company. Production of propylene and aromatic compounds from liquid feed streams. 3,714,282, Cl. 260-673.500.

Doyle, James N.: *See—*
Bucholtz, Glen E.; and Doyle, James N., 3,713,598.

Doyle, James N., to Globe Tool and Engineering Company, The. Armature winding method. 3,713,208, Cl. 29-597.000.

Dozois, James H., to General Motors Corporation. Vehicle closure system. 3,713,472, Cl. 160-189.000.

Dravo Corporation: *See—*
Heaney, Donald F., 3,713,543.
Moller, Klaus; Munch, Dietrich; and Wolert, Hartmut, 3,713,634.

Dresser Industries, Inc.: *See—*
Hopkinson, Eric C., 3,714,468.

Dri-Frac Limited: *See—*
Lozanski, Walter R., 3,713,487.

Drushel, Robert W. Percentage of maximum current and threshold voltage responsive electronic control circuit and method. 3,714,005, Cl. 204-129.200.

Druzhinin, Nikolai Sergeevich: *See—*
Zarezankov, Georgy Khristovich; Khokhlov, Alexander Semenovich; Cherepnev, Valery Ivanovich; Druzhinin, Nikolai Sergeevich; and Budtolaev, Konstantin Nikolaevich, 3,713,739.

Du Pont de Nemours, E. I., and Company: *See—*
Beckerbauer, Richard, 3,714,245.
Cline, Edward T., 3,714,054.
Hartter, Donald R., 3,714,222.
Hermes, Matthew Edward, 3,714,214.
Howard, Edward George, Jr., 3,714,117.
Tomic, Ernst A., 3,713,919.
Tullock, Charles William, 3,714,273.

Du Preez, Jan Frederick. Tubing clamps. 3,713,677, Cl. 287-54.00c.

Dubiel, Stephen. Bath tub safety divider. 3,713,179, Cl. 4-185.000.

Ducellier & Cie: *See—*
Habert, Roger Jean, 3,714,484.

Ducommun Incorporated: *See—*
Leeds, Donald H., 3,713,865.

Ducrocq, Roger; and Moreau, Charles, to Pneumatiques Coputchouc Manufacture et Plastiques Kleber-Colombes. Floating barrage. 3,713,410, Cl. 114-.50t.

Dudley, Richard, to General Motors Corporation. Vehicle seat construction. 3,713,696, Cl. 297-452.000.

Duff, Billy E.; and Taliaferro, Gerald R., to LTV Electrosystems, Inc. Torque motor. 3,714,610, Cl. 335-229.000.

Dufour, Claude: *See—*
Dedieu, Guy; and Dufour, Claude, 3,714,359.

Duncan, Dana B. Diver's weight belt. 3,713,299, Cl. 61-70.000.

Dunlop Holdings, Limited: *See—*
Folkes, Hugh L., 3,714,317.

Dunn, Wendell E., Jr. Cross-flow fluid bed reactor. 3,713,781, Cl. 23-284.000.

Dupuis, Thomas E., Jr., to Honeywell Inc. Control apparatus. 3,713,335, Cl. 73-178.00r.

Dutz, Hubert: *See—*
Geffcken, Walter; Paquet, Volker; Dislich, Helmut; Dutz, Hubert; and Mulfinger, Hans-Otto, 3,713,869.

Dwyre, James R. Fuel economizer system for a gasoline engine. 3,713,429, Cl. 123-127.000.

Dynabrade, Inc.: *See—*
Welsch, Walter N., 3,713,255.

Dynaloc Corporation: *See—*
Conrad, Rene; and Hohmann, John, 3,713,348.

Dynatronics, Inc., mesne: *See—*
Craig, Dwin R., 3,714,413.

Eagle-Picher Industries, Inc.: *See—*
Beal, Lawrence E., 3,713,950.

Eastman Kodak Company: *See—*
Crow, Rufus C., Jr.; and Runions, Adrian C., 3,713,266.
Frank, Lee F., 3,714,442.
Hoadley, Harvey Orlo, 3,714,534.
Lindholm, Robert Derwood; and Hollister, Kenneth Robert, 3,713,833.
Ross, Theron A., Jr.; and Youngman, Jon W., 3,714,547.
Stimson, Ronald M., 3,713,887.
Tanck, Frank J., Jr., 3,713,955.
Valerio, Paul F.; and Werner, Robert M., 3,713,796.
Wright, Howard N., Jr.; and Hagemeyer, Hugh J., Jr., 3,714,236.

Ebata, Hiroyuki, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener attached with a tug. 3,713,534, Cl. 206-80.000.

ECC Corporation: *See—*
Hoff, Frederick B., Jr., 3,714,474.

Eckel, Oliver C. Sound absorbing and attenuating structure. 3,713,508, Cl. 181-33.0gb.

Eckert, Frank J., to Cities Service Company. Pigment recovery. 3,713,858, Cl. 106-291.000.

Economy, James; and Clark, Rodger A., to Carborundum Company, The. Ablative composites containing novolac fibers. 3,714,111, Cl. 260-38.000.

Edamura, Fred Y.: *See—*
Larsen, Eric R.; McKendry, Lennon H.; and Edamura, Fred Y., 3,714,233.

Eddy, Thomas A.; and White, Charles E., to Abex Corporation. Locking plate for axle end cap. 3,713,686, Cl. 295-36.00r.

Edmunds, John O., to General Motors Corporation. Transmission and control. 3,713,354, Cl. 74-732.000.

Eichner, Don W., to Outboard Marine Corporation. Method of making flexible waste receptacle for marine toilets. 3,713,937, Cl. 156-245.000.

Eilers, George J.: *See—*
Crane, Hewitt D.; Pressman, Gerald L.; and Eilers, George J., 3,713,734.

Eisai Kabushiki Kaisha: *See—*
Morimoto, Kazuo; and Naito, Etsuo, 3,714,361.

Eisenberger, Peter Michael; and Schmidt, Paul Herman, to Bell Telephone Laboratories, Incorporated. Magnetic devices irradiated by penetrating electromagnetic radiation. 3,714,420, Cl. 250-42.000.

Elberon, Ira Katz; Wilson, Richard A.; and Mussinan, Cynthia J., to International Flavor & Fragrances Inc. Flavoring processes and compositions involving branched-chain alkanethiols. 3,713,848, Cl. 99-140.00r.

Electroprint, Inc.: *See—*
Crane, Hewitt D.; Pressman, Gerald L.; and Eilers, George J., 3,713,734.

Elenburg, Wayland D. Method and apparatus for isolating the bottom of a borehole from an upper formation. 3,713,488, Cl. 166-285.000.

Eltra Corporation: *See—*
Wright, Edmund S., 3,713,855.

Emelyanenko, July Georgievich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Baglai, Vitaly Mikhailovich; and Alferov, Jury Fedorovich, 3,713,476.

Emenson, Robert B.: *See—*
Beiding, William A.; Emenson, Robert B.; and Williams, Raymond L., 3,714,313.

Emerson Electric Co.: *See—*
Donnelly, Donald E.; and Krump, Robert C., 3,713,766.

Emery, Anthony Nicholas, to Ranks Hovis McDougall Limited. Enzyme chemically coupled to cellulose ether. 3,713,982, Cl. 195-63.000.

Emhart Corporation: *See—*
Surko, Walter E., Jr., 3,713,310.

Engelbrecht, Alice M.: *See—*
Downs, Ronald O.; Engelbrecht, Robert M.; Hill, James C.; and Moore, Richard N., 3,714,282.
Engelbrecht, Robert M.; Hill, James C.; and Moore, Richard N., 3,714,003.

Engelbrecht, Robert M.: *See—*
Downs, Ronald O.; Engelbrecht, Robert M.; Hill, James C.; and Moore, Richard N., 3,714,282.

Engelbrecht, Robert M.; deceased (by Engelbrecht, Alice M.; executrix); Hill, James C.; and Moore, Richard N., to Monsanto Company. Process for the production of aryl carboxylic acids. 3,714,003, Cl. 204-78.000.

Engeler, William E.: *See—*
Brown, Dale M.; Engeler, William E.; Gray, Peter V.; and Garfinkel, Marvin, 3,714,525.

Engeler, William E.; and Cordes, Linus F., to General Electric Company. High temperature low ohmic contact to silicon. 3,714,520, Cl. 317-234.00r.

Engelhardt, Edward L., to Merck & Co., Inc. Preparation of 2-phenethyl-5-trifluoromethyl benzoic acid. 3,714,239, Cl. 260-515.00a.

Engelhart, John E., to Esso Research and Engineering Company. Urea derivatives of 2-aminobenzothiazoles. 3,714,177, Cl. 260-305.000.

Engelstein, Stanley; and Dorman, Isidore, to Bell & Howell Company. Automatic card selector for random-access card file system. 3,713,535, Cl. 209-80.500.

Englehardt, William H.: *See—*
Brouwer, Frans; Englehardt, William H.; Krempel, Frank M.; and Payne, Robert A., 3,714,649.

English Clays Lovering Pochin & Company Limited: *See—*
Gwilliam, Ralph Derek, 3,713,382.

Enk, Albert T.; and Franks, David B., to Midland-Ross Corporation. High temperature furnace and conveyor therefor. 3,713,631, Cl. 263-6.00a.

Enomoto, Satoru; Wada, Hisayuki; Fujioka, Mikio; and Koguro, Masao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Water resisting and anticorrosive paint vehicle. 3,714,020, Cl. 208-14.000.

Enright, Dennis J.; Kahabka, Richard D.; and Miller, Donald F., to Minnesota Mining & Manufacturing Company. Wire splice assembly station. 3,713,214, Cl. 29-628.000.

Epic Metals Corporation: *See—*
Landis, Donald H.; and Pfaff, Richard C., 3,713,261.

Epstein, David J.; and Bullock, David C., to Massachusetts Institute of Technology. Single and polycrystalline semiconductors. 3,714,633, Cl. 340-166.00r.

Epstein, Howard C., to Becton, Dickinson Electronics Company. Compression accelerometer utilizing a lithium niobate piezoelectric crystal. 3,714,476, Cl. 310-9.500.

Erb, Theodor: *See—*
Segerdahl, Roy R.; and Erb, Theodor, 3,713,343.

Erdmann, Hans; and Miller, Franz Friedrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Complex trinuclear metal salts. 3,714,211, Cl. 260-438.500.

Erdmann, M. Otto: *See—*
Scrafford, Robert L.; and Erdmann, M. Otto, 3,714,660.

Erevanskoe otdelenie vsesojuz-nogo proektnoissledovatelsko-go proekton-konstruktorskogo i-tekhnologicheskogo institutakabelnoi promyshlennosti: *See—*
Markosian, Marlen Mamukovich; Shermazanian, Yakov Tigranovich; Kazanxhian, Grigory Paravonovich; Avakian, Jury Vardkesovich; and Vartanian, Albert Vartanovich, 3,713,727.

Erickson, Donald Henry: *See—*
Berryman, Robert Dean; Erickson, Donald Henry; and Raphel, Julio Cesar, 3,714,380.

Erickson, Fred W., to Litton Systems, Inc. Linearity correction for magnetically deflectable cathode ray tubes. 3,714,501, Cl. 315-24.000.

ESB Incorporated: *See—*
Consolloy, James W., 3,713,895.
Feldhake, Ralph H., 3,713,896.

Essex International, Inc.: *See—*
Dennis, Herman W.; and Birko, Arnold, 3,713,944.

Essmann, Carl J. Writing implement for persons with greatly impaired or lost eyesight. 3,713,230, Cl. 35-38.000.

Esso Production Research Company: *See—*
Burkhardt, Joseph A.; Childers, Thomas W.; Tidwell, Danny R.; and Koerner, Roger J., 3,714,384.
Kirby, Robert A.; and Propst, Billy J., 3,714,576.
Meitzenq Victor C., 3,713,486.

Esso Research and Engineering Company: *See—*

Engelhart, John E., 3,714,177.

Estes, Marvin F.: *See—*
Rasquinmadison, John R.; and Estes, Marvin F., 3,714,332.

Estrem, Malcolm J., to Cornelius Company, The. Coin controlled adjustable timer. 3,713,522, Cl. 194-9.000.

Ethyl Corporation: *See—*
Kobetz, Paul; and Lindsay, Kenneth L., 3,714,335.
Lerner, Sidney I., 3,714,365.

Euclid, Inc.: *See—*
Cheers, Ronald M.; and Fisch, Johannes, 3,713,666.

Eudy, William W.: *See—*
Burrous, Stanley E.; Eudy, William W.; and Siedler, Arthur J., 3,714,356.

Eurenius, Jimmie Arne: *See—*
Nilsson, Nils Edvin Folke; and Eurenius, Jimmie Arne, 3,713,303.

European Atomic Energy Community: *See—*
Van Andel, Eleonoor, 3,713,288.

Evans, George S., to Westinghouse Electric Corporation. Method and apparatus for manufacturing mercury-vapor control assemblies for electric discharge devices. 3,713,201, Cl. 29-414.000.

Evans, James P. Mud flaps. 3,713,669, Cl. 280-154.50r.

Evans, Lamar G.: *See—*
Bloom, Philip A.; Hussey, Stuart J.; and Evans, Lamar G., 3,714,325.

Evans, Richard Ernest. Dual screen remote controller. 3,714,388, Cl. 200-168.00r.

Evans, Walker, to Raymond Lee Organization, Inc., The. Portable electric oven. 3,714,394, Cl. 219-386.000.

Everbrite Electric Signs, Inc.: *See—*
Trame, Charles E., 3,713,286.

Ewing, Donald D., to Goodrich, B. F., Company, The. Flexible actuator. 3,713,685, Cl. 294-99.00r.

Exomet Incorporated: *See—*
Wiley, Donald E., 3,713,852.

Ezhov, Boris Mikhailovich: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.

Fabris, Hubert J.; Maxey, Edwin M.; and Uelzmann, Heinz. Urethane adhesive having improved sag resistance. 3,714,127, Cl. 260-77.5am.

Fairbairn, Le Roy W.: *See—*
Bright, Edward J.; and Fairbairn, Le Roy W., 3,714,617.

Fairbanks, Theodore H., to FMC Corporation. Manufacture of extruded nets having integral strand junctions. 3,713,924, Cl. 156-167.000.

Faler, John A.: *See—*
Shoemaker, Robert H.; and Faler, John A., 3,714,016.

Falk, Joseph H.; and Burnett, Lauren W. Rotary dryer. 3,713,633, Cl. 263-33.00r.

Fanslow, Ronald J., to International Harvester Compiny. Mounting blocks in vehicle frame and method of installation therein. 3,713,203, Cl. 29-428.000.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Dahm, Manfred; Kraft, Karl-Josef; and Roegler, Manfred, 3,714,080.
Herman, Karl-Heinz; and Schneider, Kurt, 3,714,108.
Kolling, Heinrich; and Kurz, Jurgen, 3,714,231.
Reischl, Artur; and Dieterich, Dieter, 3,714,095.
Steffan, Guido, 3,714,164.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Kleiner, Hans-Jerg; and Rossinger, Sigurd, 3,714,009.
Lowenfeld, Rudolf; and Kosubek, Uwe, 3,713,767.
Mundlos, Eberhard; Mohr, Reinhard; and Lohe, Konrad, 3,713,770.
Rauterkus, Karl Josef; and Seip, Detlev, 3,714,098.
Schaefer, Horst; and Neises, Helmut, 3,714,086.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius and Bruning: *See—*
Beyer, Gerhard; and Nagelsmann, Hermann, 3,713,875.

Farnsworth, Clinton E.: *See—*
Ferrari, Patrick T.; and Farnsworth, Clinton E., 3,713,645.

Farr, John P. G.; and Harris, Ivor Rex, to National Research Development Corporation. Hydrogen diffusion membranes. 3,713,270, Cl. 55-16.000.

Farr, Marvin Paul, to Ralston Purina Company. Electrical apparatus for measurement of moisture content by measurement of radio frequency power absorption utilizing a power limiting capacitor. 3,714,560, Cl. 324-61.000.

Farrington, Frederick: *See—*
Nicklin, Thomas; and Farrington, Frederick, 3,714,328.

Farrissey, William J., Jr.; Rose, James S.; and Sayigh, Adnan A. R., to Upjohn Company, The. Process for the anionic polymerization of caprolactam. 3,714,130, Cl. 260-78.001.

Farukhi, Mohammed R.: *See—*
Hofstadter, Robert; Kramer, Gerald R.; Farukhi, Mohammed R.; and Rosette, King H., 3,714,057.

Fast, Clarence R.: *See—*
O'Connor, Donald J.; and Fast, Clarence R., 3,713,393.

Fast, Clarence R.; and Mallinger, Morton A., to Amoco Production Company. Plugging of fractures in underground formations. 3,713,489, Cl. 166-292.000.

Fast, Clarence R., to Amoco Production Company. Thickened nitromethane explosive containing encapsulated sensitizer. 3,713,915, Cl. 149-2.000.

Fayling, Richard E., to Minnesota Mining and Manufacturing Company. Vehicle guidance track of transverse extent. 3,714,625, Cl. 340-32.000.

Fayling, Richard E., to Minnesota Mining and Manufacturing Company. Magnetically encoded document. 3,714,664, Cl. 346-74.00m.

Fedders Corporation: *See—*
Harris, Bradford Foster; and Scarfone, Tommaso F., 3,713,513.

Fehrs, Hellmuth, to Friedrich, Joh. Behrens. Safety device on a compressed air-operated drive-in apparatus to drive-in fasteners. 3,713,573, Cl. 227-8.000.

Feissel, Henri Gerard: *See—*
Betremieux, Pierre Arthur; Feissel, Henri Gerard; Gallard, Jean Hilaire; and Lagadec, Isidore, 3,713,885.

Feist, Wieland; Navratil, Peter; and Seifert, Roman, to Jenoptik Jean G.m.b.H. Angle-measuring instrument. 3,713,612, Cl. 248-183.000.

Feldhake, Ralph H., to ESB Incorporated. Seal for electrochemical cells. 3,713,896, Cl. 136-133.000.

Feller, Arthur G. Latch-lock mechanism for cabinet door. 3,713,682, Cl. 292-80.000.

Felt Products Mfg. Co.: *See—*
McDowell, Donald J.; and Czernik, Daniel E., 3,713,368.

Felthuis, Jacob: *See—*
Beenhakker, Albertus Hendrik; and Felthuis, Jacob, 3,713,632.

Fendrich, Charles Nelson, Jr., to AMP Incorporated. Power supply protection circuit. 3,714,511, Cl. 317-22.000.

Fenton, Donald M., to Union Oil Company of California. Hydration of amines to alcohols. 3,714,270, Cl. 260-632.00r.

Ferrari, Patrick T.; and Farnsworth, Clinton E., to Xerox Corporation. Sheet separating apparatus. 3,713,645, Cl. 271-18.00r.

Ferro Corporation: *See—*
Bouvier, John J., 3,713,795.

Fertik, Ira J., to Vernitron Corporation. Suction control handle for surgical aspirator. 3,713,443, Cl. 128-276.000.

Feuge, Reuben O.; Zeringue, Hampden J., Jr.; and Weiss, Theodore J., to United States of America, Agriculture. Process for the production of sucrose esters of fatty acids. 3,714,144, Cl. 260-234.00r.

Fiat Societa per Azioni: *See—*
Michellone, Giancarlo; Palazzetti, Mario; and Tabasso, Giovanni, 3,713,705.
Michellone, Giancarlo; Maurizio, Gilberto; Calcia, Giuseppe; Brandino, Dario; and Palazzetti, Mario, 3,713,708.
Previti, Giuseppe; and Roncarolo, Paolo, 3,713,974.

Fiber Industries, Inc.: *See—*
Carroll, Harlan R., 3,713,509.

Fibreboard Corporation: *See—*
Schafer, George; and Morse, Hugh B., 3,713,952.

Field, William E.: *See—*
Gerstenberger, Roland W.; and Field, William E., 3,714,459.

Fields, Harold E. Motor driven map viewer and tracking device. 3,713,236, Cl. 40-33.000.

Finch, Theron R.: *See—*
Sykes, Donald J.; Kroll, Harry; and Finch, Theron R., 3,713,826.

Finley, Carl E., to Olin Corporation. Camp stove wind shield latch. 3,713,432, Cl. 126-38.000.

Finvold, Rodger C.; and Davis, Charles M., to United States of America, Navy. Photoelement intense radiation protective device. 3,714,430, Cl. 250-83.30h.

Firman, Carl M. Very low frequency subminiature active antenna. 3,714,659, Cl. 343-701.000.

Fisch, Johannes: *See—*
Cheers, Ronald M.; and Fisch, Johannes, 3,713,666.

Fischer, Adolf: *See—*
Kiefer, Hans; and Fischer, Adolf, 3,714,252.

Fischer, Helmut. Radiation backscattering apparatus using an apertured precious stone as an object support. 3,714,436, Cl. 250-105.000.

Fischer, Milton G., to Deutsch Company Electronic Components Division, The. Crimping tool. 3,713,322, Cl. 72-410.000.

Fischer, Thomas R.: *See—*
Luthman, Paul A.; Stein, Maria; and Fischer, Thomas R., 3,713,661.

Fish, Frank Hamilton, to Gillette Company, The. Electrostatic spray coating methods. 3,713,873, Cl. 117-93.40r.

Fisher Controls Company, Inc.: *See—*
Luthe, Fred J., 3,713,660.

Fitch, James B., to Nash Engineering Company. Motor-driven pedestal-mounted pump assembly and method for manufacturing the same. 3,713,749, Cl. 415-200.000.

Fitzgerald, Maurice J., to Polaroid Corporation. Polymeric binders for photographic emulsions. 3,713,834, Cl. 96-114.000.

Fiziko-Energeticheskiy Institut Akademir Nauk: *See—*
Apsit, Voldemar Voldemarovich; Kokle, Juris Leovich; Skrutzitis, Karl Ernestovich; and Schukin, Mikhail Ivanovich, 3,714,480.

Fleischer, Robert L.; Price, Paul B.; Bostick, Edgar E.; and Holub, Fred F., to General Electric Company. Geometry control of etched nuclear particle tracks. 3,713,921, Cl. 156-2.000.

Fleissner, Heinz, to Vepa AG. Apparatus for shrinking continuous lengths of textile materials. 3,713,219, Cl. 26-18.500.

Fletcher, Horace, III: *See—*
Alburn, Harvey E.; and Fletcher, Horace, III, 3,714,248.
Flindt, Walter E.: *See—*
Flindt, Walter E., 3,713,668.
Flindt, Walter E., to Flindt, Walter E. and Hostelley, William V., Jr. Protective device for trailers and the like vehicles. 3,713,668, Cl. 280-150.00r.
Floyd, Terry S.: *See—*
Honeycutt, James R.; Friday, Thomas F.; and Floyd, Terry S., 3,713,358.
FMC Corporation: *See—*
Arnaud, Jose L., 3,714,329.
Davidson, Roger; and Sako, Fumio F., 3,713,540.
Fairbanks, Theodore H., 3,713,924.
Stange, Hugo, 3,714,112.
Walker, William B., 3,713,537.
Foex, Marc; Delmas, Robert; and Bonet, Claude, to Agence Nationale de Valorisation de la Recherche (ANVAR). Processes for producing plasma streams within flows of fluids. 3,714,390, Cl. 219-121.00p.
Foley, Keith Oliver, to Imperial Chemical Industries, Limited. Supporting devices. 3,713,604, Cl. 242-118.200.
Folkes, Hugh L., to Dunlop Holdings, Limited. Continuous curing process. 3,714,317, Cl. 264-231.000.
Follen, Robert J.: *See—*
Bennett, David B.; Follen, Robert J.; and Harman, Charles P., Jr., 3,714,648.
Fontijn, Arthur; and Vree, Pieter H., to Aerochem Research Laboratories, Inc. Method of determining trace amounts of gases. 3,713,773, Cl. 23-232.
Ford, James A., to Kirsch Company. Cord guiding device for a traverse rod. 3,713,473, Cl. 160-345.000.
Ford Motor Company: *See—*
Balje, Otto Erich; Bouchard, Constant L.; Knowles, James; Kosacheff, Dimitri; Pulick, Emil A.; Pulick, Michael A.; and Topouzian, Armen, 3,713,294.
Labana, Santokh S.; and Chang, Yun Feng, 3,714,120.
Nordstrom, John D., 3,714,288.
Sebestyen, Thomas M., 3,713,899.
Unnewehr, Lewis E., 3,714,533.
Watt, David A., 3,713,782.
Forrest, James S.; Litkenhus, John R.; and Steger, Donald J., to International Business Machines Corporation. Bi-directional spacing mechanism for a printer including a proportional spacing printer. 3,713,524, Cl. 197-84.000.
Forrest, Leonard W. Fire extinguishing system. 3,713,492, Cl. 169-2.00r.
Forsheda Gummifabrik Aktiebolag: *See—*
Derman, Karl Gustav Einar; and Malmstrom, Sven-Erik, 3,713,659.
Forshey, David R.; and Lisotto, Ermete C., to United States of America, Interior. Urea stabilized gelled slurry explosive. 3,713,918, Cl. 149-21.000.
Fosse, Jacuqes Andre Charles; and Pelletier, Joel Albert, to U.S. Philips Corporation. System for the transmission of information to a vehicle on rails. 3,714,419, Cl. 246-63.00c.
Foster, Arthur A., to Gorman-Rupp Company, The. Pump stroke rate and motor control. 3,714,536, Cl. 318-470.000.
Fotostudio Von Gunten & Senn: *See—*
Gunten, Adeline Von; and Schwarzkopf, Gabriel, 3,714,408.
Fouguet-Werk Frauz & Planck: *See—*
Muhlhausler, Wolfgang, 3,713,307.
Fradenburgh, Evan A.; and Kiely, Edmond F., to United Aircraft Corporation. Aerodynamic blade with high stiffness-to-weight ratio. 3,713,751, Cl. 416-87.000.
Francia, Giovanni, to L.I.R.-S.p.A.-Laboratorio Italiano Ricerche. Fluid control device. 3,713,364, Cl. 92-13.100.
Frandsen, Lee R.: *See—*
Pollman, Frederic W.; Frandsen, Lee R.; and Throckmorton, Charles D., Sr., 3,713,759.
Frangatos, Gerassimos, to Mobil Oil Corporation. Lubricant compositions. 3,714,045, Cl. 252-51.50a.
Frank, Lee F., to Eastman Kodak Company. Exposure control circuitry. 3,714,442, Cl. 250-209.000.
Franklin Electric Co., Inc.: *See—*
Whitney, John A.; Woods, Richard E.; and Hohman, William H., 3,714,451.
Franklin, Lester Kenneth. Bicycle lamp radio device. 3,714,412, Cl. 240-7.550.
Franks, David B.: *See—*
Enk, Albert T.; and Franks, David B., 3,713,631.
Franz, William F.; and Hess, Howard V., to Texaco Inc. Process and apparatus for recovering a gas constituent by membrane separation. 3,713,271, Cl. 55-16.000.
Frederick, Claud, Jr.; and Woodrum, Harold L., to American Standard Inc. Door latch cut-out forming. 3,713,217, Cl. 30-287.000.
Freeman, Donald C., Jr., to Union Carbide Corporation. Method of fabricating a superconducting magnet. 3,713,211, Cl. 29-599.000.
Freeman, Francis R.; and Vitali, Joseph D., to Amoco Production Company. Averaging circuit. 3,714,590, Cl. 328-158.000.
Freeport Mineral Company: *See—*
Matson, Rapheal F., 3,714,326.
Freeport Sulphur Company: *See—*
Morris, Horton Harold; McMahan, J. Raymond; and Rogers, William I., 3,713,593.
Freyler, Adalbert. Telescopic shock absorber for vehicles. 3,713,516, Cl. 188-129.000.
Friday, Thomas F.: *See—*
Honeycutt, James R.; Friday, Thomas F.; and Floyd, Terry S., 3,713,358.
Fridrich, Elmer G., to General Electric Company. Compact metal halide arc lamp containing primarily mercury iodides. 3,714,493, Cl. 313-184.000.
Friedrich, Joh. Behrens: *See—*
Fehrs, Hellmuth, 3,713,573.
Friend, Lawrence O., to Motorola, Inc. Temperature compensated tuner and oscillator. 3,714,606, Cl. 331-107.00r.
Fritz, Edward A., to International Harvester Company. Tine guiding device for crop pick-up. 3,713,283, Cl. 56-364.000.
Froning, H. R.: *See—*
Askew, Warren S.; and Froning, H. R., 3,714,062.
Fry, Robert Eden: *See—*
Wells, Richard Farner; and Fry, Robert Eden, 3,714,530.
Fryazinov, Vladimir Vasilievich: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.
Fuji Photo Film Co., Ltd.: *See—*
Hayashi, Jun; and Sato, Akira, 3,713,828.
Hisatake, Ono; Chiaki, Osada; and Harumi, Katsuyama, 3,714,187.
Kitajima, Masao; Kondo, Asaji; and Morishita, Masataka, 3,714,065.
Nishio, Fumihiko; Nishio, Daijiro; Watarai, Syu; Ohkubo, Kinji; and Nakajima, Yosuke, 3,713,829.
Sato, Masamichi; and Fukushima, Osamu, 3,713,422.
Shiba, Keisuke; Hinata, Masanao; and Sawahara, Masao, 3,713,832.
Fuji Shashin Film Kabushiki Kaisha: *See—*
Okano, Takeshi, 3,713,644.
Fujii, Mituharu: *See—*
Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mituharu, 3,713,983.
Fujii, Tatsuo, to Nippon Kogaku K.K. Meter compensation for a camera with interchangeable lenses and focussing screens. 3,713,369, Cl. 95-10.00c.
Fujioka, Mikio: *See—*
Enomoto, Satoru; Wada, Hisayuki; Fujioka, Mikio; and Koguro, Masao, 3,714,020.
Fujiwara, Ryozo; Ohaha, Eiji; Maeda, Kazuo; Terada, Fumio; Sugino, Toshiyuki; Arakane, Hiroyasu; and Watanabe, Yoshimoto, to Mitsui Toatsu Chemicals, Inc. Process for the preparation of sodium dithionite. 3,714,340, Cl. 423-515.000.
Fukada, Tadayuki: *See—*
Nakayama, Yujiro; Fukada, Tadayuki; and Ogawa, Masayuki, 3,714,083.
Fukuda, Muneyuki: *See—*
Tamura, Masanori; Fukuda, Muneyuki; and Ogawa, Yoji, 3,713,647.
Fukuda, Yasuhiko; and Yuyuma, Noboru, to Nippon Chemical Industrial Co., Ltd. Method for the production mordenite. 3,714,366, Cl. 423-329.000.
Fukuoka, Ichiro: *See—*
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadawaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 3,714,296.
Fukushima, Osamu: *See—*
Sato, Masamichi; and Fukushima, Osamu, 3,713,422.
Fuller, Roger L.; Gustafsson, Sven G.; Harris, Derek V.; Kaye, Robert K.; and Oliver, Joseph J., to Raytheon Company. Vehicle command and control system. 3,714,650, Cl. 343-6.52c.
Fulton, Thomas Philip; and Di Luca, Henry, to RCA Corporation. Encapsulated magnetic memory element. 3,713,886, Cl. 117-234.000.
Furman, Francis J., Jr.: *See—*
Davis, Francis C.; Cannon, Donald D.; Furman, Francis J., Jr.; and Sease, John D., 3,714,305.
Furuoka, Hideto, to Gakken Co., Ltd. Counter. 3,713,582, Cl. 235-116.000.
Futter, Menachem, to Singer Company, The. Automatic machine for sewing pocket pieces and the like to garments. 3,713,406, Cl. 112-121.150.
Gadren, George S.: *See—*
Van Dalen, Leonard; and Gadren, George S., 3,713,215.
GAF Corporation: *See—*
Randall, David I.; and Wynn, Robert W., 3,713,805.
Gaffney, Bernard J.; and Gaffney, Robert Lee, to Conwed Corporation. Method for making reticulated tubular net. 3,714,310, Cl. 264-89.000.
Gaffney, Robert Lee: *See—*
Gaffney, Bernard J.; and Gaffney, Robert Lee, 3,714,310.
Gakken Co., Ltd.: *See—*
Furuoka, Hideto, 3,713,582.
Galdabini, Renzo. Methods and apparatus for straightening or bending elongated. 3,713,312, Cl. 72-10.000.
Gallard, Jean Hilaire: *See—*

Betremieux, Pierre Arthur; Feissel, Henri Gerard; Gallard, Jean Hilaire; and Lagadec, Isidore, 3,713,885.

Galloway, James H., to Oxy Metal Finishing Corporation, mesne. Isolation and transforming circuit. 3,714,540, Cl. 321-2.000.

Galmiche, Philippe M.; Pelissier, Jean H.; and Spinat, Roland R., to Office National d'Etudes et de Recherches Aerospaticles Chatillon-Sous-Bagneux and Societe Nationale d'Etudes et de Construction de Moteurs d'Aviation. Method for the manufacture of a comosite refractory metallic element with porous coating. 3,713,206, Cl. 29-494.000.

Gamble, Bobby G.: *See—*
Copeland, Robert L.; Gamble, Bobby G.; Chase, Vance A.; and Beeler, David R., 3,713,961.

Garabedian, George: *See—*
Kennedy, William J. L.; Miczek, Charles B.; and Garabedian, George, 3,713,968.

Gardner, Irving. Tensioning device for eyeglass frames. 3,713,731, Cl. 351-113.000.

Garet, Pierre, to Rhone-Poulenc S.A. Preparation of inorganic pigments. 3,714,337, Cl. 423-508.000.

Garfinkel, Marvin: *See—*
Brown, Dale M.; Engeler, William E.; Gray, Peter V.; and Garfinkel, Marvin, 3,714,525.

Garner, Peter, to Thomas & Betts Corporation. Terminating machine for electrically connecting wire leads to posts on a terminal board. 3,713,196, Cl. 29-203.00b.

Gas Council, The: *See—*
Nicklin, Thomas; and Farrington, Frederick, 3,714,328.

Gasaway, Vincent T. Marker for radiology. 3,714,428, Cl. 250-59.000.

Gasbjerg, Knud. Cheese treating systems. 3,713,850, Cl. 99-452.000.

Gaspari, Raffaele: *See—*
Mancini, Corrado; and Gaspari, Raffaele, 3,714,123.

Gast, Theodor. Magnetic gas analyzer utilizing inductive means to sense displacements and to rebalance the analyzer. 3,714,557, Cl. 324-36.000.

Gates Rubber Company, The: *See—*
Welz, Harold C., 3,713,424.

Gaughan, Edmund J., to Stauffer Chemical Company. Pesticidal phosphorous-containing imino oxazolidines. 3,714,176, Cl. 260-307.00f.

Gaylord, Eber W.: *See—*
Arscott, Raymond L.; Gaylord, Eber W.; Mori, Ernest A.; and Morris, Richard A., 3,713,499.

Geffcken, Walter; Paquet, Volker; Dislich, Helmut; Dutz, Hubert; and Mulfinger, Hans-Otto, to JENAer Glaswerk Schott & Gen. Method of applying hard inorganic layers to plastics. 3,713,869, Cl. 117-70.00a.

Geissler, Rolf: *See—*
Stark, Gustav; Otto, Klaus; and Geissler, Rolf, 3,714,017.

Gele, Pierre: *See—*
Laprade, Bernard; Laprade, Xavier; and Gele, Pierre, 3,713,630.

General Alarm Corporation: *See—*
Hawkins, Paul Maddison, 3,713,947.

General Dynamics Corporation: *See—*
Slysh, Paul; and Hujsak, Edward J., 3,713,560.

General Electric C ompany: *See—*
Weech, Marx E., 3,714,324.

General Electric Company: *See—*
Bowers, Harry J., Jr., 3,714,407.
Brown, Dale M.; Engeler, William E.; Gray, Peter V.; and Garfinkel, Marvin, 3,714,525.
Carlstrom, Lawrence A.; and Padgett, George L., 3,713,676.
Charewicz, Francis J.; Steele, Eugene K.; and Nichols, Frank S., 3,714,318.
De Mania, Dominio; Shartrand, Allan C.; and Barton, Sterling C., 3,714,478.
Engeler, William E.; and Cordes, Linus F., 3,714,520.
Fleischer, Robert L.; Price, Paul B.; Bostick, Edgar E.; and Holub, Fred F., 3,713,921.
Fridrich, Elmer G., 3,714,493.
Gott, Brian E. B., 3,714,477.
Grabowski, Stanley J., 3,714,512.
Hamilton, Stephen B.; Beers, Melvin D.; Berger, Abe; and Selin, Terry G., 3,714,089.
Harnden, John D., Jr.; Kornrumpf, William P.; and Marquardt, Robert A., 3,714,508.
Hoback, John T.; and Holub, Fred F., 3,714,131.
Johnson, Thomas D.; Whalen, David F.; and White, Robert E., 3,714,393.
Kelley, Fred W., Jr.; Mishkovsky, Victor; and Singletary, William R., 3,714,544.
Lee, Art, 3,714,515.
Miller, Carl J.; and Ryan, William P., 3,714,213.
Miller, Edward H.; and Chesmejef, Stephen, 3,713,278.
Moran, Paul J., 3,713,892.
Niedrach, Leonard W., 3,714,015.
Rairden, John R., III, 3,714,013.
Relles, Howard M.; Orlando, Charles M.; and Schluenz, Robert W., 3,714,278.
Ring, Clinton E., 3,713,376.
Spradlin, Louis W., 3,713,313.
Staiger, William C., 3,713,709.
Sterk, Andrew A., 3,714,431.
Thor, Robert C.; and Wingrove, Earl R., Jr., 3,714,653.
Williamson, Dennis F., 3,714,452.
Wright, Archibald N.; and Mathewson, Wilfred F., Jr., 3,713,874.

General Engineering Co., (Radcliffe) Ltd.: *See—*
Bigland, Bernard Keith, 3,714,309.

General Fireproofing Company, The: *See—*
Koepke, Earl H., 3,713,697.

General Foods Corporation: *See—*
Lavo, Harry F.; and Cante, Charles J., 3,713,404.
Leidy, Harold T.; Kerrigan, Charles M.; and Byble, Duane C., 3,713,837.

General Latex and Chemical Corporation: *See—*
Gordon, Philip L.; and La Torre, Augustin, 3,713,868.
Gordon, Philip L.; and La Torre, Augustin, 3,714,078.

General Mills, Inc.: *See—*
Kuffel, Richard A., 3,713,845.

General Motors Corporation: *See—*
Blanchard, Houston F., 3,713,667.
Dillman, Ned E.; Gillund, Arden G.; Muth, Victor O.; and Recupito, Pasquale, 3,714,627.
Dozois, James H., 3,713,472.
Dudley, Richard, 3,713,696.
Edmunds, John O., 3,713,354.
Hause, Gilbert K., 3,713,757.
Hawkins, Cyril M., 3,713,518.
Kerr, Lamar L., 3,713,520.
Kind, Ronald W., 3,713,338.
Podolan, Edward G.; and Przybysz, Francis C., 3,713,689.
Sawyer, Elbert M.; and Kelly, Fred H., 3,714,450.
Scheiter, Milton H., 3,713,353.
Sharpe, Cecil H., 3,713,588.
Shimer, Daniel W.; and Salihi, Jalal T., 3,713,504.

General Telephone Company of California: *See—*
Searls, Charles E., 3,713,613.

General Tire & Rubber Company, The: *See—*
Cobbledick, David S.; and Norman, Arthur J., 3,714,077.

Genma, Sanji: *See—*
Watanabe, Hikoitsu; and Genma, Sanji, 3,713,498.

Gerek, Gene: *See—*
Hartzell, Rowland S.; and Gerek, Gene, 3,713,925.

Gershberg, David Benedict, to American Cyanamid Company. Process for recovering acrylamide polymers from gels. 3,714,136, Cl. 260-89.70s.

Gerstenberger, Roland W., to Jensen Machinery Inc. Folding aid. 3,713,643, Cl. 270-61.000.

Gerstenberger, Roland W.; and Field, William E., to Jensen Machinery Inc. Timing apparatus. 3,714,459, Cl. 307-141.00r.

Gervais, Henry O.: *See—*
Delaney, John J.; and Gervais, Henry O., 3,713,502.

Gess, Larry C. Apparatus for sealing container caps. 3,713,268, Cl. 53-334.000.

Gevaert-Agfa, N.V.: *See—*
Willems, Jozef Frans, 3,713,827.

Gey, William A.: *See—*
Crescenzo, Frank G.; Gey, William A.; and Wiebke, Armin T., 3,713,383.

Ghirga, Marcello: *See—*
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,714,237.

Giammerco, Giuseppe, 1/2 to Vetrocope Cokapuania S.p.A. Gas purification process. 3,714,327, Cl. 423-220.000.

Gibson, James O.: *See—*
Rottmayer, Earl; Carman, Robert R.; and Gibson, James O., 3,713,959.

Gierth, Volker: *See—*
Pfannmueller, Helmut; Urban, Friedrich; Gropper, Hans; and Gierth, Volker, 3,714,135.

Gilbert, William J.: *See—*
Thompson, Larry O.; Gilbert, William J.; Thompson, Louis R.; Martin, James W., Jr.; and Clements, William Lamar, 3,713,554.

Gillette Company, The: *See—*
Davidson, Henry, 3,714,314.
Fish, Frank Hamilton, 3,713,873.
Nigro, Louis V., 3,713,464.
Webster, Milo E., 3,713,586.

Gilligan, William H.; and McQuistion, William E., to United States of America, Navy. Difluoroamino compounds. 3,714,261, Cl. 260-583.0nh.

Gillund, Arden G.: *See—*
Dillman, Ned E.; Gillund, Arden G.; Muth, Victor O.; and Recupito, Pasquale, 3,714,627.

Ginther, Gary D., to Clyde Corporation. Elevator-feeder structure. 3,713,527, Cl. 198-53.000.

Giorgi, Angelo L.; and Szklarz, Eugene G., to United States of America, Atomic Energy Commission. Process for preparing high-transition-temperature superconductors in the Nb-Al-Ge system. 3,713,898, Cl. 148-126.000.

Girard, Eric Lionel, to Plastic Coating Corporation, The. Light-activated diazography. 3,713,825, Cl. 96-49.000.

Gittenait, Marcel, to Societe Anonyme: Ugine Kuhlmann. Reaction of phosphoric acid, urea, and ammonia. 3,713,802, Cl. 71-29.000.

Givaudan Corporation: *See—*
Dahill, Robert T., Jr., 3,714,220.

Glaser, Josef: *See—*
Vogt, Gerd; Kurth, Johannes; and Glaser, Josef, 3,713,478.

Glass Containers Corporation: *See—*
Parkinson, Dean B.; and Brown, Arthur G., 3,713,867.
Glaxo Laboratories Limited: *See—*
Davis, Benjamin; and Phillips, Gordon Hanley, 3,714,352.
Gleim, William K. T., to Universal Oil Products Company. Conversion of asphaltene-containing hydrocarbon charge stocks. 3,714,026, Cl. 208-108.000.
Gleim, William K. T., to Universal Oil Products Company. Conversion of asphaltene-containing hydrocarbon charge stocks. 3,714,027, Cl. 208-108.000.
Globe Tool and Engineering Company, The: *See—*
Biddison, John M., 3,713,209.
Bucholtz, Glen E.; and Doyle, James N., 3,713,598.
Dickensheets, Carlton O.; and Steizer, James G., 3,713,563.
Doyle, James N., 3,713,208.
Gochman, Carl: *See—*
Bell, Stanley C.; and Gochman, Carl, 3,714,188.
Godfrey, John J.; and Morgan, Charles R., to Grace, W. R., & Co. Process for preparing aminonitriles. 3,714,223, Cl. 260-465.50a.
Goebel, Henry R., to Western Kraft Corporation. Cylindrical carton. 3,713,576, Cl. 229-21.000.
Goetz, Allan C.; Cortesi, Roger S.; and Hauck, Lester A., to Westinghouse Electric Corporation. Scene auto-correlator. 3,713,742, Cl. 356-206.000.
Goffe, William L., to Xerox Corporation. Migration imaging system with molten liquid development. 3,713,818, Cl. 96-1.00r.
Gold, Harold, to United States of America, National Aeronautics and Space Administration. Gas turbine engine fuel control. 3,713,290, Cl. 60-39.28r.
Gold, Kenneth Stewart: *See—*
Pelta, Edmond R.; and Gold, Kenneth Stewart, 3,714,499.
Goldberg, Jack, to Monsanto Company. Variable duty cycle signal generator. 3,714,470, Cl. 307-261.000.
Goldfarb, Adolph E.: *See—*
Goldfarb, Adolph E.; and Soriano, Rene (said Soriano assor. to said), 3,713,655.
Goldfarb, Adolph E. Moving target game. 3,713,654, Cl. 273-108.000.
Goldfarb, Adolph E.; and Soriano, Rene, said Soriano assor. to said Goldfarb, Adolph E. Magnetic play apparatus. 3,713,655, Cl. 273-135.0ad.
Goldin, Morris, to Hughes Tool Co. Lockless firearm system. 3,713,240, Cl. 42-15.000.
Goldman, Thomas M.: *See—*
Jordan, Robert L.; Wilson, Norman E.; and Goldman, Thomas M., 3,714,040.
Goldshein, Jury Moiseevich Goldshein: *See—*
Chepelev, Viktor Gavrilovich; Grinchenko, Nikolai Nikolaevich; and Goldshein, Jury Moiseevich Goldshein, 3,714,455.
Goldstein, Alma W.: *See—*
Martin, Jerry Roy; and Goldstein, Alma W., 3,714,142.
Goldsworthy Engineering, Inc.: *See—*
Goldsworthy, William B.; and Hardesty, Ethridge E., 3,713,572.
Goldsworthy, William B.; and Hardesty, Ethridge E., to Goldsworthy Engineering, Inc. Material feeding system. 3,713,572, Cl. 226-7.000.
Goller, Robert L.: *See—*
Grindrod, Paul E.; Goller, Robert L.; and Seiferth, Oscar E., 3,713,849.
Gooch, Lester, to Midland Optical Incorporated. Two piece goggle construction. 3,713,732, Cl. 351-153.000.
Goodelle, Roger A.: *See—*
Derner, William J.; Stewart, Harold E.; Root, Lawrence E.; and Goodelle, Roger A., 3,713,712.
Goodman, Harold. Toy submarine convertible to an airplane. 3,713,249, Cl. 46-74.00r.
Goodrich, B. F., Company, The: *See—*
Ewing, Donald D., 3,713,685.
Knechtges, Donald P.; and Antifinger, George J., 3,714,101.
Goodrich, Robert S., to Ranger Pneumatic Tool Company. Pneumatic reciprocating tool. 3,713,365, Cl. 91-25.000.
Goodyear Aerospace Corporation: *See—*
Rottmayer, Earl; Carman, Robert R.; and Gibson, James O., 3,713,959.
Goodyear Tire & Rubber Company, The: *See—*
Kline, Richard H., 3,714,122.
Goodyear Tire and Rubber Company, The: *See—*
Spacht, Ronald B., 3,714,264.
Gordon, Harry W., to Schmid, Julius, Inc. Method of treating prostatic hypertrophy. 3,714,347, Cl. 424-115.000.
Gordon, Harry W.; and Schaffner, Carl P., to Schmid, Julius Inc. Method for controlling absorption of cholesterol. 3,714,348, Cl. 424-117.000.
Gordon, Philip L.; and La Torre, Augustin, to General Latex and Chemical Corporation. Acrylic-nitrile foam-backed fabric and method of preparation. 3,713,868, Cl. 117-65.200.
Gordon, Philip L.; and La Torre, Augustin, to General Latex and Chemical Corporation. Foamable acrylic latex composition and method of preparation. 3,714,078, Cl. 260-2.50l.
Gordy, Edward M. Bacon broiler. 3,713,379, Cl. 99-349.000.
Gorman-Rupp Company, The: *See—*
Foster, Arthur A., 3,714,536.
Gornometallurgichesky Institut Kolskogo Filliala Akademii Nauk USSR: *See—*
Sladkov, Alexandr Stepanovich, 3,713,597.
Gott, Brian E. B., to General Electric Company. Combination flux shield and flux shunt for a dynamoelectric machine. 3,714,477, Cl. 310-256.000.
Gottstein, William J.; and Cheney, Lee C., to Bristol-Myers Company. Novel syntheses of cephalexin and intermediates therefor. 3,714,146, Cl. 260-239.100.
Gough, Stanley T. D., to Mobil Oil Corporation. Phosphate esters of homophthalimides. 3,714,169, Cl. 260-283.00p.
Gough, Stanley T. D., to Mobil Oil Corporation. Phosphoryl and thiophosphoryl pyrones as insecticides. 3,714,350, Cl. 424-203.000.
Gouirand, Rene, to Mercadante, Joseph. Air suspension with tapered air bag. 3,713,665, Cl. 280-124.00f.
Gould Inc., mesne: *See—*
Shirland, Fred A., 3,713,893.
Grabowski, Joseph P.; and Powell, Walter E., Jr., to United States of America, Navy. Single error channel monopulse system. 3,714,652, Cl. 343-16.00m.
Grabowski, Stanley J., to General Electric Company. Protection circuit for transistor modulators. 3,714,512, Cl. 317-33.0vr.
Grace, Martin I.; Kroger, Harry; and Pratt, Harold J., Jr., to Sperry Rand Corporation. Broad band high efficiency mode energy converter. 3,714,605, Cl. 331-107.00r.
Grace, W. R., & Co.: *See—*
Bowden, Woodrow R., Jr.; Owen, Dave L.; Calvert, Orville M.; and Holcombe, Edward L., 3,713,267.
Godfrey, John J.; and Morgan, Charles R., 3,714,223.
Kehr, Clifton L.; and Wszolek, Walter R., 3,714,290.
Mac Cragh, Adolfo P.; Patil, Arvind S.; and Ashby, George E., 3,713,816.
Triggiani, Leonard Vincent; and Stone, Irving Charles, 3,714,061.
Grain Processing Corporation: *See—*
Schweiger, Richard G.; and Muller, Siegfried A., 3,714,210.
Grainger, Lewis M.D. Anti-pollution heating system. 3,713,433, Cl. 126-116.00r.
Gramont, John R., Jr.: *See—*
Hyman, Herbert B.; and Gramont, John R., Jr., 3,713,238.
Granning, Ole, to Granning Suspensions, Inc. Vehicle suspension. 3,713,663, Cl. 280-112.00r.
Granning Suspensions, Inc.: *See—*
Granning, Ole, 3,713,663.
Granure Corporation Limited, The, mesne: *See—*
Kingston, Alan Cyril, 3,714,113.
Grassi, Arturo: *See—*
Haugh, Gordon A.; Grassi, Arturo; and Haugh, Gordon A., 3,713,940.
Gray, Claude W. Stringshot back-off tool. 3,713,484, Cl. 166-117.500.
Gray, Frederick William, to Colgate-Palmolive Company. Stain removal. 3,714,050, Cl. 252-99.000.
Gray, Peter V.: *See—*
Brown, Dale M.; Engeler, William E.; Gray, Peter V.; and Garfinkel, Marvin, 3,714,525.
Gray Tool Company: *See—*
Holbert, Marvin L., Jr., 3,713,485.
Grecchi, Giorgio. Process and apparatus for coating panels with resinous compositions. 3,713,935, Cl. 156-231.000.
Green, Joseph: *See—*
Roth, Shirley H.; Green, Joseph; and Seipel, John J., 3,714,081.
Roth, Shirley H.; Green, Joseph; and Seipel, John J., 3,714,082.
Greenough, Paul E., to Lubrizol Corporation, The. Treated overbased complexes. 3,714,042, Cl. 252-33.200.
Greenwald, John R.: *See—*
Pierce, Ogden R.; and Greenwald, John R., 3,714,275.
Pierce, Ogden R.; and Greenwald, John R., 3,714,276.
Greer, Homer L., to Honeywell Inc. Conductivity sensor. 3,714,555, Cl. 324-30.00b.
Gregory, Paulee: *See—*
Lubsen, Timothy A.; Joffe, Frederick M.; Gregory, Paulee; and McSwiggin, Joseph R., 3,713,842.
Greidinger, Dahlia S.; and Cohen, Liuba, to Chemicals & Phosphates Ltd. Nitrogen-phosphate fertilizers and their manufacture. 3,713,801, Cl. 71-29.000.
Greipel, Frank J. Catalytic muffler. 3,713,783, Cl. 23-288.00f.
Grenda, Victor J., to Merck & Co., Inc. Preparation of 2-methyl-3,4-disubstituted phenylalamines. 3,714,241, Cl. 260-519.000.
Grenier, John E., to Lodding Engineering Corporation. Mounting means for foil-type and similar elements. 3,713,610, Cl. 248-1.000.
Gribowski, George J.; Osborne, William B.; and Wilson, Rexford, to Kidde, Walter, & Company, Inc., mesne. Fire protection apparatus. 3,713,491, Cl. 169-2.00r.
Griffith Laboratories, Inc., The: *See—*
Turner, William J.; Henry, Wayne E.; and Hubb, Gary W., 3,713,846.
Griffith, Walter L. Machine for applying high consistency fluids an semi-solids to bakery and other products. 3,713,418, Cl. 118-15.000.
Grimaud, Edouard: *See—*
Blaise, Jean; and Grimaud, Edouard, 3,714,297.
Grinchenko, Nikolai Nikolaevich: *See—*
Chepelev, Viktor Gavrilovich; Grinchenko, Nikolai Nikolaevich; and Goldshein, Jury Moiseevich Goldshein, 3,714,455.
Grindrod, Paul E.; Goller, Robert L.; and Seiferth, Oscar E., to Mayer, Oscar, & Company, Inc. Meat package. 3,713,849, Cl. 99-174.000.
Griot, Rudolf G., to Sandoz-Wander, Inc. Acetic acid derivatives as hypolipidemics. 3,714,362, Cl. 424-324.000.
Gropper, Hans: *See—*

Pfannmueller, Helmut; Urban, Friedrich; Gropper, Hans; and Gierth, Volker, 3,714,135.

Gross, Frederick A., to International Rectifier Corporation. Differential pressure switch using elongated tube and spaced interior wire. 3,714,386, Cl. 200-81.00r.

Grossman, Burton C., to Hazeltine Corporation. Spread-spectrum position monitoring system. 3,714,573, Cl. 325-32.000.

Grosso, Patrick F.; Rutherford, Robert E., Jr.; and Sargent, Donald E., to Columbia Broadcasting System, Inc. Method of electrophoretic deposition of cathodoluminescent materials. 3,714,011, Cl. 204-181.000.

Grover, Phillip C.: *See—*
Grover, Russell C.; and Grover, Phillip C., 3,713,234.

Grover, Russell C.; and Grover, Phillip C. Transplanter with stress compensating blade guide means. 3,713,234, Cl. 37-2.00r.

Gruber, Alvin. Beverage fountain structure. 3,713,583, Cl. 239-17.000.

Gruver, Robert M.: *See—*
Kirchner, Henry P.; Walker, Ralph E.; and Gruver, Robert M., 3,713,877.

GTE Automatic Electric Laboratories, Incorporated: *See—*
Ammann, Robert W.; Creasy, James R.; and Dorenbos, David O., 3,714,403.
Busch, John E.; and Puccini, Sergio E., 3,714,379.
Hiestand, David F., 3,714,376.
Macrander, Max S., 3,714,548.
Risky, Frank A., 3,714,556.

GTE Sylvania Incorporated: *See—*
Johnson, Alfred D.; Say, Donald L.; and Smithgall, Harry E., 3,714,489.
Peterson, Carl L.; and Webb, Edward A., 3,714,485.
Roche, William J., 3,714,492.
Valdes, Silverio Antonio, 3,714,578.
Valdes, Silverio Antonio; and Waybright, George Cleveland, 3,714,579.

Guardian Industries Corporation: *See—*
McMaster, Harold A., 3,713,799.

Gubernick, Joseph; Krause, Robert J.; Lerner, Amos; and Mosca, Gianni. Two-part aluminum salt antiperspirant aerosol compositions. 3,714,346, Cl. 424-47.000.

Gubler, Kurt, to Ciba-Geigy Corporation. Certain 3-hydroxy-triazenes and their use in controlling insects and arachnids. 3,714,351, Cl. 424-226.000.

Guerriero, Joe D.: *See—*
Long, Bobby R., 3,713,216.

Guidi, William R. Portable magnetic tape recorder having electronic error detecting means. 3,714,666, Cl. 346-74.00m.

Gulf & Western Industrial Products Company: *See—*
Heniser, Eugene W.; Jensen, James W.; and Hook, Bernard K., 3,713,409.

Gulf Oil Canada Limited: *See—*
Reiss, Walter B., 3,714,102.

Gulf Oil Corporation: *See—*
Peterson, Frank C.; and Theard, Leslie P., 3,713,927.

Gulf Research & Development Company: *See—*
Arscott, Raymond L.; Gaylord, Eber W.; Mori, Ernest A.; and Morris, Richard A., 3,713,499.
Bunting, Pamela M.; and Leathen, William W., 3,713,976.
Bunting, Pamela M.; and Leathen, William W., 3,713,984.
Notaro, Vincent A.; and Selwitz, Charles M., 3,714,277.
Schwartzbeck, Richard A., 3,713,807.

Gunten, Adeline Von; and Schwarzkopf, Gabriel, to Fotostudio Von Gunten & Senn. Multiple flash bulb device. 3,714,408, Cl. 240-1.300.

Gurtner, Klaus: *See—*
Burdelski, Theo; and Gurtner, Klaus, 3,713,306.

Gustafsson, Sven G.: *See—*
Fuller, Roger L.; Gustafsson, Sven G.; Harris, Derek V.; Kaye, Robert K.; and Oliver, Joseph J., 3,714,650.

Gutmann, Hugo; Manz, Ulrich; and Schwieter, Ulrich, to Hoffmann-La Roch Inc. Polyene coloring compositions. 3,714,367, Cl. 424-333.000.

Gwilliam, Ralph Derek, to English Clays Lovering Pochin & Company Limited. Tube pressure filters. 3,713,382, Cl. 100-112.000.

Haak, Williard J.; and Marsden, Howard A., to Caterpillar Tractor Company. Pressure and/or flow compensating means. 3,713,295, Cl. 60-452.000.

Haan, Harold U. Vehicle generator system. 3,713,503, Cl. 180-65.00r.

Haas, Davey S.: *See—*
Dare, Sherman E.; Haas, Davey S.; Herold, Stanley J.; Norris, Steven R.; Patterson, Terry V.; and Sloan, Robert E., 3,713,394.

Habert, Roger Jean, to Ducellier & Cie. Rotor assembly for use in a dynamo electric machine. 3,714,484, Cl. 310-263.000.

Hafner, Oliver B., to Altec Manufacturing Company, Inc. Body construction. 3,713,717, Cl. 312-195.000.

Hagemeyer, Hugh J., Jr.: *See—*
Wright, Howard N., Jr.; and Hagemeyer, Hugh J., Jr., 3,714,236.

Hagenbach, Robert J.; and Lenhard, Myron J., to Xerox Corporation. Xerographic imaging and development using metal oxide carrier particles. 3,713,819, Cl. 96-1.0sd.

Hager Aktiebolag: *See—*
Hager, Bror Olof, 3,713,963.

Hager, Bror Olof, to Hager Aktiebolag. Dry mixture of copper sulfate, 8-hydroxyquinoline sulfate, and sulfuric acid as a preservative additive to a fibrous slurry prior to forming paper therefrom. 3,713,963, Cl. 162-161.000.

Hagood, Gideon J., Jr.: *See—*
Naumann, Eugene C.; and Hagood, Gideon J., Jr., 3,714,405.

Hahn, Erwin L.; and McCall, Samuel L., to University of California, The Regents of the. Method and apparatus for propagating traveling wave energy through resonant matter. 3,714,438, Cl. 250-199.000.

Haid, Erich: *See—*
Bergmeyer, Hans Ulrich; Haid, Erich; Hochstetter, Michael; and Weimann, Gunter, 3,713,986.

Hallman, Newt M., to Universal Oil Products Company. High temperature, high pressure hydrocarbon conversion process. 3,714,028, Cl. 208-111.000.

Ham, Jack Wesley; and Poplin, John Milton, to RCA Corporation. Alignment and test fixture apparatus. 3,714,572, Cl. 324-158.00f.

Hamilton, Gordon W.; Moir, Ralph W.; Osher, John E.; and Post, Richard F., to United States of America, Atomic Energy Commission. Energetic neutral particle injection system for controlled fusion reactor. 3,713,967, Cl. 176-5.000.

Hamilton, John Arthur; Hughes, David Robert; and O'Connor, Leo Thomas, Jr., to International Business Machines Corporation. Standard adapter method and apparatus. 3,714,635, Cl. 340-172.500.

Hamilton, Stephen B.; Beers, Melvin D.; Berger, Abe; and Selin, Terry G., to General Electric Company. Curable compositions. 3,714,089, Cl. 260-18.00s.

Hampl, Edward F., Jr., to Minnesota Mining and Manufacturing Company. Pressure-contact structure for thermoelectric generators. 3,714,539, Cl. 321-1.500.

Hanabusa, Kanehisa: *See—*
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadawaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 3,714,296.

Hanitsch, Rolf: *See—*
Nurnberg, Werner; and Hanitsch, Rolf, 3,714,483.

Hanke, August M., to United States of America, Navy. Folded tensioned highline system. 3,713,548, Cl. 214-13.000.

Hanko, Jimmy J., to Weyerhaeuser Company. Display carton with dust flap locking construction. 3,713,530, Cl. 206-45.140.

Hann, Everette O.: *See—*
Lewis, Charles W.; and Hann, Everette O., 3,714,143.

Hannah, John: *See—*
Sarett, Lewis H.; and Hannah, John, 3,714,232.

Hansen, Arne, to Kidde, Walter & Company, Inc. Safety valve for use in filling of fire extinguishers. 3,713,493, Cl. 169-31.00r.

Harbron, Donald L., Jr.: *See—*
Blakley, Earl T.; Chupka, David E.; Harbron, Donald L., Jr.; Marsh, Paul G.; and Seifert, Peter, 3,713,594.

Hardesty, Ethridge E.: *See—*
Goldsworthy, William B.; and Hardesty, Ethridge E., 3,713,572.

Hardway, Edward V., Jr., to Spearhead, Inc. Method and apparatus for measuring mechanical properties of the respiratory system. 3,713,436, Cl. 128-2.080.

Hardy, John F.: *See—*
Berstein, Gregor; Hardy, John F.; and Doppler, Leonard H., 3,714,085.

Harman, Charles P., Jr.: *See—*
Bennett, David B.; Follen, Robert J.; and Harman, Charles P., Jr., 3,714,648.

Harnden, John D., Jr.; Kornrumpf, William P.; and Marquardt, Robert A., to General Electric Company. Sequential flashing of multiple lamps by low cost static control circuit of integrated design. 3,714,508, Cl. 315-241.000.

Harris, Bernard: *See—*
Butzow, Neil W.; and Harris, Bernard, 3,713,932.

Harris, Bradford Foster; and Scarfone, Tommaso F., to Fedders Corporation. Crankcase evacuation and oil return system. 3,713,513, Cl. 184-6.160.

Harris, Derek V.: *See—*
Fuller, Roger L.; Gustafsson, Sven G.; Harris, Derek V.; Kaye, Robert K.; and Oliver, Joseph J., 3,714,650.

Harris, Harry G., Jr.: *See—*
Toth, Charles; Bailey, Raymond V.; and Harris, Harry G., Jr., 3,713,809.

Harris, Harry Gordon, Jr.: *See—*
Toth, Charles; and Harris, Harry Gordon, Jr., 3,713,811.

Harris, Ivor Rex: *See—*
Farr, John P. G.; and Harris, Ivor Rex, 3,713,270.

Harris, Le Roy S., to K-G Industries, Inc. Briquet breaker means. 3,713,763, Cl. 425-308.000.

Harris-Intertype Corporation: *See—*
Horvath, Robert M., 3,714,496.
Murray, James E.; and Kirsch, Robert P., 3,713,600.

Hart, Donald P.: *See—*
Porter, Samuel, Jr.; Hart, Donald P.; and Seiner, Jerome A., 3,713,872.

Hartley, Kenneth: *See—*
Mills, Alfred Leonard; and Hartley, Kenneth, 3,714,058.

Hartman, Eugene H.: *See—*
Klingbeil, Werner W.; and Hartman, Eugene H., 3,713,928.

Hartter, Donald R., to Du Pont de Nemours, E. I., and Company. Preparation of diaminomaleonitrile by chemical reduction of diiminosuccinonitrile. 3,714,222, Cl. 260-465.50r.

Hartzell, Rowland S.; and Gerek, Gene, to PPG Industries, Inc. Asbestos sheet material directly adhered to a cellular foam substrate. 3,713,925, Cl. 156-78.000.
Harumi, Katsuyama: *See—*
Hisatake, Ono; Chiaki, Osada; and Harumi, Katsuyama, 3,714,187.
Haselmo, Robert D. Rocker arm stud drilling and pinning kit. 3,713,747, Cl. 408-115.000.
Hatch, Laurie G.: *See—*
Link, William T.; and Hatch, Laurie G., 3,714,416.
Hatton, John A., Jr.: *See—*
Baum, Melvin E.; and Hatton, John A., Jr., 3,714,292.
Baum, Melvin E.; and Hatton, John A., Jr., 3,714,293.
Baum, Melvin E.; and Hatton, John A., Jr., 3,714,294.
Hauck, Lester A.: *See—*
Goetz, Allan C.; Cortesi, Roger S.; and Hauck, Lester A., 3,713,742.
Haufe, Werner, to Schleicher GmbH & Co. Electromechanical time relay. 3,713,285, Cl. 58-39.500.
Haugh, Gordon A.: *See—*
Haugh, Gordon A.; Grassi, Arturo; and Haugh, Gordon A., 3,713,940.
Haugh, Gordon A.; Grassi, Arturo; and Haugh, Gordon A., to Haugh, Gordon, Packaging Company Limited. Method for securing handles to sheet material. 3,713,940, Cl. 156-250.000.
Haugh, Gordon, Packaging Company Limited: *See—*
Haugh, Gordon A.; Grassi, Arturo; and Haugh, Gordon A., 3,713,940.
Haugwitz, Rudiger D.; and Narayanan, Venkatachala Lakeshmi, to Squibb, E. R., & Sons, Inc. Sulfonyl benzimidazoles. 3,714,180, Cl. 260-309.200.
Haurie, Michel: *See—*
Desgrandchamps, Guy; Hemmer, Henri; and Haurie, Michel, 3,714,286.
Hauschild, Ulrich: *See—*
Holst, Rudolf; and Hauschild, Ulrich, 3,713,803.
Hause, Gilbert K., to General Motors Corporation. Hydraulic energy translating device. 3,713,757, Cl. 418-133.000.
Hawkins, Cyril M., to General Motors Corporation. Decoupler control. 3,713,518, Cl. 192-46.000.
Hawkins Mfg. Inc.: *See—*
Hawkins, Roy I., 3,713,497.
Hawkins, Paul Maddison, to General Alarm Corporation. Wiring method. 3,713,947, Cl. 156-293.000.
Hawkins, Roy I., to Hawkins Mfg. Inc. Replaceable blade row crop ditcher with bedding rail. 3,713,497, Cl. 172-719.000.
Hayakawa, Shigeru: *See—*
Matsuo, Yoshihiro; Sasaki, Hiromu; and Hayakawa, Shigeru, 3,713,853.
Hayashi, Jun; and Sato, Akira, to Fuji Photo Film Co., Ltd. Multi-layer color photographic silver halide light-sensitive materials. 3,713,828, Cl. 96-74.000.
Hayashibara Company: *See—*
Kurimoto, Masashi; and Hirao, Mamoru, 3,713,978.
Hayes, John C.; and Pollitzer, Ernest L., to Universal Oil Products Company. Dehydrogenation with a catalytic composite containing platinum rhenium, a group VI transition metal and an alkali or alkaline earth metal. 3,714,281, Cl. 260-668.00d.
Hayes, Lester P.; Jones, Rexford W.; and Thompson, William B., to Staley, A. E., Manufacturing Company. Coating composition comprising photoactivator and film-forming organic material for powder development. 3,713,831, Cl. 96-88.000.
Hayes, William A. Single sideband AM-FM modulation system. 3,714,577, Cl. 325-145.000.
Hays, William R.: *See—*
Matherly, James E.; and Hays, William R., 3,714,109.
Hazeltine Corporation: *See—*
Grossman, Burton C., 3,714,573.
HB Engineering Corporation: *See—*
Baker, Hugh M., Jr., 3,714,475.
Heaney, Donald F., to Dravo Corporation. Activated sewage plant. 3,713,543, Cl. 210-196.000.
Heard, John P. Pollution control apparatus. 3,713,276, Cl. 55-222.000.
Hedlund, Roger C.: *See—*
Deboo, Gordon J.; and Hedlund, Roger C., 3,714,588.
Heflich, Henry G., to Kahle Engineering Co. Means for cutting glass tubes. 3,713,570, Cl. 225-93.500.
Hellstrom, Harold Richard. Alarms for night latch. 3,714,644, Cl. 340-274.000.
Helmer, John C.: *See—*
Anderson, Weston A.; and Helmer, John C., 3,714,417.
Helms, Horace H.; Rozner, Alexander G.; and Spencer, Dana E., to United States of America, Navy. Incendiary cutting torch for underwater use. 3,713,636, Cl. 266-23.0nn.
Hemmer, Henri: *See—*
Desgrandchamps, Guy; Hemmer, Henri; and Haurie, Michel, 3,714,286.
Hemphill, Charles Wayne. Apparatus for insitu encasement of tubular members within cementitious material. 3,713,760, Cl. 425-59.000.
Hendrickson, Philip J.; and Resch, Richard J., to Krueger Metal Products, Inc. Self-centering support. 3,713,618, Cl. 248-417.000.
Heniser, Eugene W.; Jensen, James W.; and Hook, Bernard K., to Gulf & Western Industrial Products Company. Apparatus and method for bonding adhesive seams on can bodies. 3,713,409, Cl. 113-12.000.
Henry, David W.: *See—*
Hoff, Dale R.; and Henry, David W., 3,714,158.
Henry, Wayne E.: *See—*
Turner, William J.; Henry, Wayne E.; and Hubb, Gary W., 3,713,846.
Hensley, Dwight E.: *See—*
Slodki, Morey E.; Smiley, Millie Jo; and Hensley, Dwight E., 3,713,979.
Hensley, Richard D.: *See—*
Buhrman, Robert P.; and Hensley, Richard D., 3,713,601.
Hercules Incorporated: *See—*
Braak, Edmund C.; and McCarty, Kenneth P., 3,713,916.
Kim, Charles W., 3,713,942.
Herman, Karl-Heinz; and Schneider, Kurt, to Farbenfabriken Bayer Aktiengesellschaft. Mixture of mould parting agents for polyamide moulding compositions. 3,714,108, Cl. 260-31.40r.
Hermanson, Terry, to Christmas, Mr., Incorporated. Trunk for collapsible artificial tree. 3,713,957, Cl. 161-14.000.
Hermes, Matthew Edward, to Du Pont de Nemours, E. I., and Company. Alkoxy silyl alkyl compounds. 3,714,214, Cl. 260-448.80r.
Herold, Stanley J.: *See—*
Dare, Sherman E.; Haas, Davey S.; Herold, Stanley J.; Norris, Steven R.; Patterson, Terry V.; and Sloan, Robert E., 3,713,394.
Herrbrich, Bernd, to Porsche, Dr.-Ing. H.c.F., K.G., Firma. Apparatus for the automatic operation of operating devices for motor vehicles. 3,713,332, Cl. 73-117.000.
Herrling, Siegfried: *See—*
Huemer, Heinrich; Herrling, Siegfried; and Muckter, Heinrich, 3,714,206.
Herron, Francis H.; deceased, (by Herron, Rosa C.; executrix), to Petrolite Corporation. Corrosion tes probe assembly. 3,714,012, Cl. 204-195.00c.
Herron, Rosa C.: *See—*
Herron, Francis H., 3,714,012.
Hess, Gunther; Martens, Gerhard; and Pohl, Kurt, to Vickers-Zimmer Aktiengesellschaft Planung und Bau von Industrieanlagen. Reaction element for the conversion of hydrocarbons. 3,713,784, Cl. 23-288.00r.
Hess, Howard V.: *See—*
Franz, William F.; and Hess, Howard V., 3,713,271.
Hester, Jackson B., Jr., to Upjohn Company, The. Pyridobenzodiszepinones. 3,714,149, Cl. 260-239.30t.
Hester, Jackson B., Jr., to Upjohn Company, The. 6,7-Dihydro-7-alkyl-5h-1,2,4-triazolo [4,3-d] [1,4] benzodiazepines and their production. 3,714,178, Cl. 260-308.00r.
Heubl, Walter. Wheel element for toy building set. 3,713,248, Cl. 46-23.000.
Hewlett-Packard Company: *See—*
Cutler, Leonard S., 3,714,607.
Hiestand, David F., to GTE Automatic Electric Laboratories, Incorporated. Shock resistant semiconductor microphone having magnetically operated overload mechanism. 3,714,376, Cl. 179-110.00b.
Hileman, Ronald E.; and Campbell, James T., to United States of America, Air Force. Birefringent optical correlator. 3,714,404, Cl. 235-181.000.
Hill, Jacques A. F.; and Adams, Richard H., to United States of America, Navy. Load reducing spike for supersonic missiles. 3,713,607, Cl. 244-3.100.
Hill, James C.: *See—*
Downs, Ronald O.; Engelbrecht, Robert M.; Hill, James C.; and Moore, Richard N., 3,714,282.
Engelbrecht, Robert M.; Hill, James C.; and Moore, Richard N., 3,714,003.
Hill, Joseph Henry; Kelling, Geoffrey Philip; and Spikes, Roger Hugh, to Vanderwell Products Limited. Methods of manufacturing flanged bearings. 3,713,714, Cl. 308-237.000.
Hill, Marion E.: *See—*
Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., 3,714,254.
Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., 3,714,260.
Coon, Clifford L.; and Hill, Marion E., 3,714,272.
Hills, Derek William; and Sach, George Sidney, to Smith Kline and French Laboratories Limited. Acetylenic carbamates. 3,714,224, Cl. 260-468.00c.
Hinata, Masanao: *See—*
Shiba, Keisuke; Hinata, Masanao; and Sawahara, Masao, 3,713,832.
Hindersinn, Raymond R.: *See—*
Wilson, Bruce N.; and Hindersinn, Raymond R., 3,714,079.
Hinkle, Lloyd A. Adjustable stair assembly. 3,713,511, Cl. 182-95.000.
Hirao, Mamoru: *See—*
Kurimoto, Masashi; and Hirao, Mamoru, 3,713,978.
Hirata, Arthur Atsunobu, to Abbott Laboratories,. Stabilized erythrocyees and methods therefore. 3,714,345, Cl. 424-3.000.
Hirayama, Kazuhiro, to Iwatsu Electric Company Limited. Circuit for controlling an intensity of a scanning in an electromagnetic deflection type cathode ray tube. 3,714,502, Cl. 315-30.000.
Hirota, Eiichi: *See—*
Chiba, Hiroyuki; Masuda, Hideaki; and Hirota, Eiichi, 3,713,193.
Hirschel, Louis R., to United States of America, Navy. Method of reducing errors arising from the radio frequency oscillator system of optically pumped magnetometers. 3,714,552, Cl. 324-.50r.

Hisatake, Ono; Chiaki, Osada; and Harumi, Katsuyama, to Fuji Photo Film Co., Ltd. Spiro (indoline-2,2'-2H'-chromene)photochromic compounds. 3,714,187, Cl. 260-326.110.
Hitachi Limited: *See—*
Hosoki, Shigeyuki; Okano, Hiroshi; and Kamijo, Kazuaki, 3,714,422.
Hitachi, Ltd.: *See—*
Baba, Takesi; Osada,Koichi; Hokawa, Takuya; and Suzuki, Fumio, 3,714,574.
Kariya, Shizuo; Narita, Hiroshi; Tuboi, Takashi; and Takahashi, Tetsuya, 3,714,467.
Kuwabara, Takeo; Kiwaki, Hisakatsu; Sato, Hiroshi; and Onoda, Yoshimitsu, 3,714,541.
Hjelm, Karl Erik Waldemar, to Aktiebolaget Bofors. Ignition device in a rocket-assisted projectile. 3,713,389, Cl. 102-49.700.
Hoadley, Harvey Orlo, to Eastman Kodak Company. Electrical motor-damping circuit for a self-positioning system. 3,714,534, Cl. 318-368.000.
Hoback, John T.; and Holub, Fred F., to General Electric Company. Polyamideimides. 3,714,131, Cl. 260-78.0tf.
Hobday, Cyril: *See—*
Beal, Walter; Hobday, Cyril; Jack, James; and Keenan, John Francis Edmund, 3,713,769.
Hochbach, Friedrich, to Reichhold-Albert-Chemie Aktiengesellschaft. Process for the rapid consolidation of moist soil. 3,713,297, Cl. 61-36.00r.
Hochstetter, Michael: *See—*
Bergmeyer, Hans Ulrich; Haid, Erich; Hochstetter, Michael; and Weimann, Gunter, 3,713,986.
Hodan, James John: *See—*
Dever, James L.; and Hodan, James John, 3,714,302.
Hodgkinson, Joseph B.; and Morey, Roger John, to Pilkington Brothers Limited. Stacking of sheets. 3,713,650, Cl. 271-87.000.
Hoff, Dale R.; and Henry, David W., to Merck & Co., Inc. 5-Nitro-2-aminomethyl imidadoles. 3,714,158, Cl. 260-247.50r.
Hoff, Frederick B., Jr., to ECC Corporation. Electron-voltaic effect device. 3,714,474, Cl. 310-3.000.
Hoffmann, William D., to Mannorth Service Corporation. Bottle crushing apparatus. 3,713,596, Cl. 241-99.000.
Hoffmann, Wolfgang; and Wick, Paul, to Canadian International Paper Company. Packaging apparatus. 3,713,526, Cl. 198-34.000.
Hoffmann-La Roch Inc.: *See—*
Gutmann, Hugo; Manz, Ulrich; and Schwieter, Ulrich, 3,714,367.
Hoffmann-La Roche Inc.: *See—*
Jaffe, Gerald Myer; and Rehl, William Richard, 3,714,242.
Lerner, Irwin; and McGrath, Robert Paul, 3,714,355.
Saucy, Gabriel, 3,714,262.
Hofmann, Arthur R.: *See—*
Besenbruch, Alex; and Hofmann, Arthur R., 3,713,256.
Hofmann, Gunter A. G., to Hughes Aircraft Company. Method and apparatus for ignition of crossed field switching device for use in a hvdc circuit breaker. 3,714,510, Cl. 317-11.00a.
Hofmann, Ludwig. Belt clasp. 3,713,191, Cl. 24-201.00a.
Hofmeister, Helmut; Steinbeck, Hermann; and Wiechert, Rudolf, to Schering Aktiengesellschaft. 1α,2α; 6β,7β-dimethylene steriods. 3,714,207, Cl. 260-397.400.
Hofstadter, Robert; Kramer, Gerald R.; Farukhi, Mohammed R.; and Rosette, King H., to Kewanee Oil Company. Iodide activated thallium chloride scintillator. 3,714,057, Cl. 252-301.40r.
Hogg, Walter R.: *See—*
Coulter, Wallace H.; and Hogg, Walter R., 3,714,565.
Hohman, William H.: *See—*
Whitney, John A.; Woods, Richard E.; and Hohman, William H., 3,714,451.
Hohmann, John: *See—*
Conrad, Rene; and Hohmann, John, 3,713,348.
Hokawa, Takuya: *See—*
Baba, Takesi; Osada,Koichi; Hokawa, Takuya; and Suzuki, Fumio, 3,714,574.
Holbert, Marvin L., Jr., to Gray Tool Company. Petroleum well safety valve. 3,713,485, Cl. 166-224.000.
Holbrook, Robert, to Western Electric Company, Incorporated. Bonding apparatus having means for continuous monitoring of the bond. 3,713,575, Cl. 228-6.000.
Holcombe, Edward L.: *See—*
Bowden, Woodrow R., Jr.; Owen, Dave L.; Calvert, Orville M.; and Holcombe, Edward L., 3,713,267.
Holliaday, Forrest E. Fish filleting and skinning boards. 3,713,188, Cl. 17-70.000.
Holland, Leslie Arthur: *See—*
Laurenson, Laurence; and Holland, Leslie Arthur, 3,713,754.
Hollister, Kenneth Robert: *See—*
Lindholm, Robert Derwood; and Hollister, Kenneth Robert, 3,713,833.
Holst, Rudolf; and Hauschild, Ulrich, to Kali-Chemie AG. Production of phosphate fertilizers. 3,713,803, Cl. 71-45.000.
Holub, Fred F.: *See—*
Fleischer, Robert L.; Price, Paul B.; Bostick, Edgar E.; and Holub, Fred F., 3,713,921.
Hoback, John T.; and Holub, Fred F., 3,714,131.
Honda, Hironobu: *See—*
Kuniyasu, Yosihiro; Matsumoto, Akio; Isobe, Eiji; and Honda, Hironobu, 3,713,787.
Honeycutt, James R.; Friday, Thomas F.; and Floyd, Terry S., to Celanese Corporation. Apparatus and process for severing flexible sheet material. 3,713,358, Cl. 83-35.000.
Honeywell Inc.: *See—*
Bennett, David B.; Follen, Robert J.; and Harman, Charles P., Jr., 3,714,648.
Bur, Philip W., 3,714,537.
Dupuis, Thomas E., Jr., 3,713,335.
Greer, Homer L., 3,714,555.
Medlar, Lewis A., 3,713,339.
Ogawa, Francis T., 3,714,443.
SAGE George E., 3,714,581.
Weidner, Evert C., 3,713,894.
Honeywell Information Systems, Inc.: *See—*
Crump, Robert O., 3,713,197.
Hong, Se J.; and Patel, Arvind M., to International Business Machines Corporation. Double error correcting method and system. 3,714,629, Cl. 340-146.1al.
Hoogendoorn, Abraham: *See—*
Kuijk, Karel Elbert; and Hoogendoorn, Abraham, 3,714,600.
Hook, Bernard K.: *See—*
Heniser, Eugene W.; Jensen, James W.; and Hook, Bernard K., 3,713,409.
Hooker Chemical Corporation: *See—*
Rosenberg, David S., 3,714,274.
Wilson, Bruce N.; and Hindersinn, Raymond R., 3,714,079.
Hooks, Claud H.; and Hooks, Margaret W., to Camper Improvements Company. Poor man's camper for station wagons. 3,713,687, Cl. 296-23.00r.
Hooks, Margaret W.: *See—*
Hooks, Claud H.; and Hooks, Margaret W., 3,713,687.
Hooper, S. W., & Company, Ltd.: *See—*
Hooper, Sydney W. H., 3,713,536.
Hooper, Sydney W. H., to Hooper, S. W., & Company, Ltd. Pressure pulp screen. 3,713,536, Cl. 209-273.000.
Hoover, Erwin Frederick; and Sinkovitz, Gloria DiMarco, to Calgon Corporation. Dispersing clays, pigments and the like with amino. 3,713,859, Cl. 106-308.00n.
Hope Kabushiki Kaisha: *See—*
Mochizuki, Yoshinari, 3,713,231.
Hopkinson, Eric C., to Dresser Industries, Inc. Pulsed power supply system. 3,714,468, Cl. 307-252.00j.
Horie, Yoshihiro: *See—*
Suzuki, Hidenori; Iizaka, Isao; Horie, Yoshihiro; Maeda, Katsumi; and Inagaki, Shotaro, 3,713,737.
Horie, Yukio, to Dai Nihon Bungu Kabushiki Kaisha; a/t/a Japan Stationery Co., Ltd., The. Push-type mechanical pencil. 3,713,745, Cl. 401-94.000.
Horiuchi, Jiro: *See—*
Kondo, Seigo; Tabata, Toshikazu; and Horiuchi, Jiro, 3,714,166.
Hornschemeyer, Wolfgang: *See—*
Wallbaum, Hans Joachim; and Hornschemeyer, Wolfgang, 3,713,808.
Horvath, Robert M., to Harris-Intertype Corporation. Compensation for graphical image display system for compensating the particular non-linear characteristic of a display. 3,714,496, Cl. 315-18.000.
Hoshiyama, Masao: *See—*
Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshio; Kawanishi, Masazumi; Sato, Masanori; Hoshiyama, Masao; and Nagao, Taku, 3,714,171.
Hosoki, Shigeyuki; Okano, Hiroshi; and Kamijo, Kazuaki, to Hitachi Limited. Scanning stereoscopic electron microscope. 3,714,422, Cl. 250-49.502a.
Hostelley, William V., Jr.: *See—*
Flindt, Walter E., 3,713,668.
Hott, Ion V. K., to Joyce-Cridland Company, The. Vehicle lift. 3,713,515, Cl. 187-8.410.
Hougland, Oscar, to Leggett & Platt Incorporated. Bed frame. 3,713,181, Cl. 5-176.00r.
Houston Engineers, Inc.: *See—*
Webb, Derrel D., 3,713,481.
Hovens, Paulus Joseph Maria; and Smeulers, Wouter, to U.S. Philips Corporation. Stabilized capacitive sawtooth generator. 3,714,454, Cl. 307-109.000.
Hovey, Patrick Bruce. Insect catchers. 3,713,245, Cl. 43-110.000.
Howard, Edward George, Jr., to Du Pont de Nemours, E. I., and Company. Thermally stabilized fluoroketone/vinyl fluoride copolymers. 3,714,117, Cl. 260-45.90r.
Howe, Philip T. Meter socket voltage recorder unit. 3,714,516, Cl. 317-104.000.
Howell, Jack D. Apparatus for measuring the effective value of electrical waveforms. 3,714,570, Cl. 324-132.000.
Howmedica, Inc.: *See—*
Weisman, Sidney, 3,713,175.
Howson-Algraphy Limited: *See—*
Watkinson, Leonard James, 3,713,830.
Hoya Glass Works: *See—*
Izumitani, Tetsuro; Asahara, Yoshiyuki; Tsuchiyz, Makoto; and Nagarekawa, Osamu, 3,714,073.
Matsuura, Takashi; and Chikano, Mitsuo, 3,714,055.
Hubb, Gary W.: *See—*
Turner, William J.; Henry, Wayne E.; and Hubb, Gary W., 3,713,846.
Hubscher, Maurice A.: *See—*

Asker, Gunnar C. F.; and Hubscher, Maurice A., 3,713,281.
Huemer, Heinrich; Herrling, Siegfried; and Muckter, Heinrich, to Chemie Gruenenthal GmbH. Benzo-2,3,1-diazoborines. 3,714,206, Cl. 260-397.700.
Huff, Richard R., to Monsanto Company. Wood treating process. 3,713,943, Cl. 156-255.000.
Huffman, Herman M., to Midland-Ross Corporation. Hydraulic brake system. 3,713,292, Cl. 60-54.50p.
Hughes Aircraft Company: *See—*
Hofmann, Gunter A. G., 3,714,510.
Mears, Carleton M., Jr.; and Oberle, Paul W., 3,714,434.
Suzuki, Clarence K., 3,713,900.
Hughes, David Robert: *See—*
Hamilton, John Arthur; Hughes, David Robert; and O'Connor, Leo Thomas, Jr., 3,714,635.
Hughes Tool Co.: *See—*
Goldin, Morris, 3,713,240.
Huhn, Helmut; and Kuhn, Horst, to Wolff, Walsrode Aktiengesellschaft. Suspension polymerization of utnylidene halide in presence of polyuinylidene halide stabilizer. 3,714,103, Cl. 260-29.6rb.
Hujsak, Edward J.: *See—*
Slysh, Paul; and Hujsak, Edward J., 3,713,560.
Hummel, Matt N., to Acra Electric Corporation. Electrical heating unit. 3,714,395, Cl. 219-544.000.
Hunley, William H.: *See—*
Wischhoefer, William J. G.; and Hunley, William H., 3,713,414.
Hunnicutt, Cecil C. Safety footwear. 3,713,233, Cl. 36-61.000.
Hunsucker, Jerry Hoyt. Dimethylol propionic acid-urea-aldehyde resins. 3,714,124, Cl. 260-70.00a.
Hunt, Paul D.: *See—*
Tetenbaum, Marvin; and Hunt, Paul D., 3,714,060.
Hunt, Philip A., Chemical Corporation: *See—*
Sykes, Donald J.; Kroll, Harry; and Finch, Theron R., 3,713,826.
Hunt, Robert A., to Biggar, F. M., Jr. Automatic scribing machine. 3,713,223, Cl. 33-24.00c.
Hunter, Edwin J., to Toro Manufacturing Corporation. Powered sprinkler. 3,713,584, Cl. 239-206.000.
Hurlemann, Ernst, to Werkzeugmaschinen-Fabrik Oerlikon Buhrle AG. Automatic firearm. 3,713,363, Cl. 89-185.000.
Hurt, Robert H. Power hand truck. 3,713,501, Cl. 180-9.220.
Hurth, Carl Maschinen-und Zahnradfabrik: *See—*
Lichtenauer, Gerd, 3,713,316.
Hussey, Stuart J.: *See—*
Bloom, Philip A.; Hussey, Stuart J.; and Evans, Lamar G., 3,714,325.
Hyatt, Alfred Ray, to Brown & Root, Inc. Pipeline bundle laying operations. 3,713,275, Cl. 61-72.300.
Hycel, Inc.: *See—*
Moran, John J., 3,713,785.
Hyde, James S., to Varian Associates. Microwave spectrometer apparatus. 3,714,550, Cl. 324-.50r.
Hydrocouple Corporation: *See—*
Arnold, James F., 3,713,204.
Hydronautics, Incorporated: *See—*
Johnson, Virgil E., 3,713,699.
HydroTech Services, Inc.: *See—*
White, William E., Jr., 3,713,675.
Hyman, Herbert B.; and Gramont, John R., Jr. Postcard including photograph mounting means. 3,713,238, Cl. 40-158.000.
Hyster Company: *See—*
Monroe, James G., 3,713,688.
Ianuzzi, Anthony P., to United States of America, Navy. Deep ocean submersible. 3,713,412, Cl. 114-16.00r.
ICI America, Inc.: *See—*
Lee, John T. M., 3,713,458.
Ideal Toy Corporation: *See—*
Cooper, Julius; and Moe, Walter, 3,713,656.
Idemitsu Kosan Co., Ltd.: *See—*
Aritomi, Choji, 3,713,328.
Iffland, Roger L.: *See—*
Alling, Richard L.; and Iffland, Roger L., 3,713,713.
IIT Research Institute: *See—*
Camras, Marvin, 3,713,212.
Iizaka, Isao: *See—*
Suzuki, Hidenori; Iizaka, Isao; Horie, Yoshihiro; Maeda, Katsumi; and Inagaki, Shotaro, 3,713,737.
Ikegai Tekko Kabushiki Kaisha: *See—*
Sato, Yoshimasa, 3,713,269.
Illinois Tool Works, Inc.: *See—*
Madland, Robert C., 3,714,611.
Imai, Hirosuke; and Koizumi, Takeo, to Nippon Oil Company, Limited. Process for the production of 5-alkylidenenorbornene-2. 3,714,279, Cl. 260-666.0py.
Imperial Chemical Industries Limited: *See—*
Broadbent, Douglas; Turner, Ralph William; and Walton, Peter Leslie, 3,713,981.
Colchester, John Edward; and Carey, John Gerard, 3,714,174.
Foley, Keith Oliver, 3,713,604.
Johnson, Peter Graham, 3,714,075.
Mallion, Keith Blakeney; Turner, Ralph William; and Todd, Alexander Henry, 3,714,161.
Reid, James Angus Wilson, 3,714,126.
Turnbull, Brian, 3,713,384.
Imperial Chemical Industries of Australia and New Zealand Limited: *See—*
Dewar, Robert Alfred; and Walliczek, Erwin Gunther, 3,714,341.
Imperial Paper Company: *See—*
Manning, Jmes H., 3,714,088.
Inagaki, Shotaro: *See—*
Suzuki, Hidenori; Iizaka, Isao; Horie, Yoshihiro; Maeda, Katsumi; and Inagaki, Shotaro, 3,713,737.
Inamorato, Jack Thomas, to Colgate-Palmolive Company. Foam profile regulating composition and anionic detergent composition containing same and having inverse foam to temperature relationship. 3,714,074, Cl. 252-528.000.
Industrial Science & Technology, Agency of: *See—*
Nomura, Harehiko; and Shimamoto, Susumu, 3,714,371.
Inmont Corporation: *See—*
Ackerman, Joseph Francis; Beerli, George; Savageau, Robert George; and Weisfeld, Joseph, 3,713,864.
Inoue, Touru; Noguchi, Seizo; and Mukai, Tsu, to Nippon Sheet Glass Co., Ltd. and Nippon Glass Fiber Co., Ltd. Process for production of optical fiber bundles. 3,713,729, Cl. 350-320.000.
Institut Elektrosvarki Imeni E. O. Patona Akademii Nauk Ukrainskoi SSR: *See—*
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,714,368.
Institut Khimii-Prirodnykh Soedineny Im. M.M. Shemuakina akademie Nauk SSSR: *See—*
Zakharychev, Ardalion Vladimirovich; Serebryakova, Tatyana Andreevna; Ananchenko, Sopia Nikolaevna; and Torgov, Igor Vladimirovich, 3,714,235.
Institut National de la Recherche Atominique: Etablissements Gourdon: *See—*
Blachere, Henri T.; and Jamart, Guy Georges, 3,714,445.
Institut National de la Sante et de la Recherche Medicale: *See—*
Rips, Richard, 3,714,250.
Instrumentation Specialties Company: *See—*
Allington, Robert W., 3,714,591.
Inter-Lock Steel Company, Inc.: *See—*
Mort, Robert E.; and Creaser, George E., 3,713,381.
International Business Machines Corporation: *See—*
Agusta, Benjamin; and Lubart, Eneil D., 3,713,908.
Beausoleil, William F., 3,714,637.
Champ, Robert B.; Cherry, Albert J.; and Shattuck, Meredith D., 3,713,820.
Forrest, James S.; Litkenhus, John R.; and Steger, Donald J., 3,713,524.
Hamilton, John Arthur; Hughes, David Robert; and O'Connor, Leo Thomas, Jr., 3,714,635.
Hong, Se J.; and Patel, Arvind M., 3,714,629.
Van Pelt, Richard W.; and Werner, Allen J., 3,713,606.
International Computers Limited: *See—*
Derc, Roman, 3,713,646.
International Flavor & Fragrances Inc.: *See—*
Elberon, Ira Katz; Wilson, Richard A.; and Mussinan, Cynthia J., 3,713,848.
International Gari-Systems, Inc.: *See—*
Crane, Edward J., 3,713,352.
International Harvester Company: *See—*
Fritz, Edward A., 3,713,283.
Redford, Robert L., 3,713,495.
International Harvester Compiny: *See—*
Fanslow, Ronald J., 3,713,203.
International Rectifier Corporation: *See—*
Gross, Frederick A., 3,714,386.
International Telephone and Telegraph Corporation: *See—*
Asher, Ralph L., 3,714,658.
Lyon, Zeno G., 3,714,651.
Miller, Charles Eveleigh; and Schlatter, Gerald Lance, 3,713,324.
Scrafford, Robert L.; and Erdmann, M. Otto, 3,714,660.
Williams, Robert G.; and Berthold, Wolfgang K., 3,714,439.
Ion Equipment Corporation: *See—*
Orris, Edward C., 3,714,019.
Ireco Chemicals: *See—*
Cook, Melvin A.; Clay, Robert B.; and Udy, Lex L., 3,713,917.
Cook, Melvin Alonzo; and Bailey, Donald T., 3,713,914.
Ishida, Ryuichi: *See—*
Shigezane, Suzu; Naoi, Fusaji; Saito, Seiichi; Kojima, Michio; and Ishida, Ryuichi, 3,714,175.
Isobe, Eiji: *See—*
Kuniyasu, Yoshihiro; Matsumoto, Akio; Isobe, Eiji; and Someno, Kenji, 3,713,477.
Kuniyasu, Yosihiro; Matsumoto, Akio; Isobe, Eiji; and Honda, Hironobu, 3,713,787.
Itek Corporation: *See—*
Berman, Elliot; and Philbrick, Richard W., 3,713,823.
Buchan, William R., 3,713,723.
Manhardt, John R., 3,713,824.
Ito, Akira: *See—*
Takahashi, Masaaki; Yamauchi, Takashi; Okuda, Kensuke; and Ito, Akira, 3,714,021.
Ito, Katsunori: *See—*
Sakakibara, Shigeru; Kato, Takaaki; and Ito, Katsunori, 3,713,351.

Ito, Ken; Kaminaka, Hiroshi; and Oie, Kunihisa, to Sumitomo Chemical Company, Ltd. Process for producing 2,6-dimethylphenol. 3,714,269, Cl. 260-621.00r.

Ivanier, Isin. Die for cold drawing. 3,713,323, Cl. 72-467.000.

Iwaasa, Takashi: *See—*
Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mituharu, 3,713,983.

Iwama, Atsuaki: *See—*
Yoshida, Shoushi; Iwama, Atsuaki; Odada, Takashi; and Suda, Tetsuo, 3,714,321.

Iwasa, Ichiro: *See—*
Matsuda, Kazuo; Tanaka, Yoshiaki; Sakai, Takeyo; and Iwasa, Ichiro, 3,714,266.

Iwatani & Co., Ltd.: *See—*
Maruyama, Takeji; and Uenae, Tadao, 3,713,793.

Iwatsu Electric Company Limited: *See—*
Adachi, Syozo; and Ueyama, Masasi, 3,714,048.
Hirayama, Kazuhiro, 3,714,502.

Izumitani, Tetsuro; Asahara, Yoshiyuki; Tsuchiyz, Makoto; and Nagarekawa, Osamu, to Hoya Glass Works. Semiconductive glass having low resistance. 3,714,073, Cl. 252-512.000.

Jack, James: *See—*
Beal, Walter; Hobday, Cyril; Jack, James; and Keenan, John Francis Edmund, 3,713,769.

Jacob, Heinz-Jurgen, to U.S. Philips Corporation. X-ray tube having external means to align electrodes. 3,714,487, Cl. 313-60.000.

Jaffe, Gerald Myer; and Rehl, William Richard, to Hoffmann-La Roche Inc. Process for the preparation of L-dopa. 3,714,242, Cl. 260-519.000.

Jalink, Antony, Jr., to United States of America, National Aeronautics and Space Administration. Infrared horizon locator. 3,714,432, Cl. 250-83.30h.

Jallais, Francois Denis, to Societe Industrielle Bull-General Electric (Societe Anonyme). Apparatus for the photo-optical reading of marks and perforations on record media. 3,714,447, Cl. 250-227.000.

Jamart, Guy Georges: *See—*
Blachere, Henri T.; and Jamart, Guy Georges, 3,714,445.

Janfeld, Johannes: *See—*
Dorschner, Oskar; Storkebaum, Christoph; Carduck, Franz Josef; and Janfeld, Johannes, 3,713,590.

Janssen, Paul Adriaan Jan; Niemegeers, Carlos Jan Ernest Josef; Stokbroekx, Raymond Antoine; and Vandenberk, Jan, to Janssen Pharmaceutica, N.V. 2,2-Diaryl-4-(4'-aryl-4'-hydroxy-piperidino)-butyramides. 3,714,159, Cl. 260-247.100.

Janssen Pharmaceutica, N.V.: *See—*
Janssen, Paul Adriaan Jan; Niemegeers, Carlos Jan Ernest Josef; Stokbroekx, Raymond Antoine; and Vandenberk, Jan, 3,714,159.

Japan Atomic Energy Research Institute: *See—*
Takehisa, Masaaki; and Senrui, Shiro, 3,714,008.

Japan Storage Battery Co., Ltd.: *See—*
Nakamura, Ryoji, 3,713,413.

Japanese National Railways: *See—*
Baba, Takesi; Osada,Koichi; Hokawa, Takuya; and Suzuki, Fumio, 3,714,574.

Jaquay, Paul T., to United States of America, Air Force. Transducer for measuring the displacement of an electrically conductive objection. 3,714,561, Cl. 324-61.00p.

Jaquette, Robert D., to Air-Way Manufacturing Company. O-ring mounting machine. 3,713,199, Cl. 29-211.00r

Jatcko, Joseph. Taper lock break-away pole structure. 3,713,262, Cl. 52-296.000.

Jefferson Chemical Company, Inc.: *See—*
Lichtenwalter, Myrl; and Austin, Thomas Howard, 3,714,259.
Rowton, Richard Lee; and Yeakey, Ernest Leon, 3,714,128.

JENAer Glaswerk Schott & Gen.: *See—*
Geffcken, Walter; Paquet, Volker; Dialich, Helmut; Dutz, Hubert; and Mulfinger, Hans-Otto, 3,713,869.

Jenoptik Jean G.m.b.H.: *See—*
Feist, Wieland; Navratil, Peter; and Seifert, Roman, 3,713,612.

Jensen, James W.: *See—*
Heniser, Eugene W.; Jensen, James W.; and Hook, Bernard K., 3,713,409.

Jensen, Jens Herman: *See—*
Madsen, Rud Frik; and Jensen, Jens Herman, 3,713,341.

Jensen Machinery Inc.: *See—*
Gerstenberger, Roland W., 3,713,643.
Gerstenberger, Roland W.; and Field, William E., 3,714,459.

Jensen, Robert L. Vaned rotor engine and compressor. 3,713,426, Cl. 123-8.200.

Jirik, Frank J. Grain sampler. 3,713,342, Cl. 73-422.000.

Joffe, Frederick M.: *See—*
Lubsen, Timothy A.; Joffe, Frederick M.; Gregory, Paulee; and McSwiggin, Joseph R., 3,713,842.

Johnson, Alfred D.; Say, Donald L.; and Smithgall, Harry E., to GTE Sylvania Incorporated. Multibeam single gun electron discharge device. 3,714,489, Cl. 313-69.00r.

Johnson, Christopher Linley; Whitmarsh, John Robert William; and Basford, Kenneth Arnold, to Secretary of State for Defence, mesne. Centrifugal governor. 3,713,344, Cl. 73-546.000.

Johnson, Clifford T.; Neuhaus, Herbert M.; Silver, Wallace E.; Whiting, Gordon D.; and Larson, Richard A. N., to United States of America, Navy. Method and apparatus for manufacture of and improvements in explosive transfer link. 3,713,361, Cl. 86-22.000.

Johnson, Glenn Norman. Lid hinge. 3,713,578, Cl. 229-44.00m.

Johnson, Peter Graham, to Imperial Chemical Industries Limited. Chlorinated hydrocarbon compositions and uses thereof. 3,714,075, Cl. 252-545.000.

Johnson, Thomas D.; Whalen, David F.; and White, Robert E., to General Electric Company. System for producing a constant number of pulses per unit length of traveling strip. 3,714,393, Cl. 235-92.0dm.

Johnson, Virgil E., to Hydronautics, Incorporated. System for eroding solids with a cavitating fluid jet. 3,713,699, Cl. 299-14.000.

Johnston, David B. R.: *See—*
Windholz, Thomas B.; Johnston, David B. R.; and Patchett, Arthur A., 3,714,208.

Johnston, Robert F., to Bell & Howell Company. Sensing fiducial markings form motion picture film. 3,713,733, Cl. 352-109.000.

Jones, Donald W. Method and apparatus for thin layer chromatography. 3,714,035, Cl. 210-31.00c.

Jones, Edwin K., to Universal Oil Products Company. Alkylation-fractionator. 3,713,615, Cl. 196-139.000.

Jones, Geoffrey A.: *See—*
Mason, Henry J.; and Jones, Geoffrey A., 3,713,228.

Jones, Horace: *See—*
Law, Malcolm John; and Jones, Horace, 3,713,999.

Jones, Rexford W.: *See—*
Hayes, Lester P.; Jones, Rexford W.; and Thompson, William B., 3,713,831.

Jones, Robert W.: *See—*
Wicks, Steven A.; and Jones, Robert W., 3,714,654.

Jonnes, Nelson, to Minnesota Mining and Manufacturing Company. Elastomeric composition of neoprene, polyether polyprimar-polyamine and a basic curing agent. 3,714,115, Cl. 260-41.50a.

Jordan, Robert L.; Wilson, Norman E.; and Goldman, Thomas M., to Stauffer Chemical Company. Process of regenerating carbon beds. 3,714,040, Cl. 252-415.000.

Jorgensen, John Mulliner: *See—*
Dingwall, Andrew Gordon Francis; and Jorgensen, John Mulliner, 3,714,638.

Jory, Howard R., to Varian Associates. Network for pulling a microwave generator to the frequency of its resonant load. 3,714,592, Cl. 328-233.000.

Josias, Conrad S.; Bowman, Lloyd D.; and Lovelock, James E., said Lovelock assor. to Analog Technology Corporation. Gas detector and analyzer. 3,714,421, Cl. 259-43.5mr.

Joyce-Cridland Company, The: *See—*
Hott, Ion V. K., 3,713,515.

Judd, Claude I., to Colgate-Palmolive Company. Esters of bicyclic aminoalcohols. 3,714,225, Cl. 260-473.00a.

Junak, Edward M.: *See—*
Schweitzer, John C.; and Junak, Edward M., 3,714,507.

Jurga, Jan: *See—*
Pajak, Zdzislaw; Jurga, Kazimierz; and Jurga, Jan, 3,714,551.

Jurga, Kazimierz: *See—*
Pajak, Zdzislaw; Jurga, Kazimierz; and Jurga, Jan, 3,714,551.

K-G Industries, Inc.: *See—*
Harris, Le Roy S., 3,713,763.

Kaashoek, Johannes, to U.S. Philips Corporation. Colour television display device. 3,714,500, Cl. 315-24.000.

Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Wallbaum, Hans Joachim; and Hornschemeyer, Wolfgang, 3,713,808.

Kabisch, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of hydrogen peroxide. 3,714,342, Cl. 423-588.000.

Kabushiki Kaisha Imamura Seisakusho: *See—*
Yano, Yoshio, 3,714,401.

Kabushiki Kaisha Taihei Seisakusho; a/k/a Taihei Machinery Works, Ltd.: *See—*
Tamura, Masanori; Fukuda, Muneyuki; and Ogawa, Yoji, 3,713,647.

Kabushiki Kaisha Takenishi Seisakusho: *See—*
Moritake, Koiti, 3,713,521.

Kabushiki Kaisha Toyoda Jidoshoki Seisakusho: *See—*
Nakayama, Shozo, 3,713,758.

Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo: *See—*
Ueno, Ryuzr; and Miyazaki, Tetsuya, 3,714,227.

Kadawaki, Takashi: *See—*
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadawaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 3,714,296.

Kadoya, Shizuo: *See—*
Dohmori, Renzo; Kadoya, Shizuo; Takamura, Isao; Oshima, Yasuo; and Naito, Takeo, 3,714,170.

Kadron, Stanley F., to Bendix Corporation, The. Automatic beat frequency oscillator switch for an airborne automatic direction finder. 3,714,582, Cl. 325-341.000.

Kahabka, Richard D.: *See—*
Enright, Dennis J.; Kahabka, Richard D.; and Miller, Donald F., 3,713,214.

Kahle Engineering Co.: *See—*
Heflich, Henry G., 3,713,570.

Kaiser Aluminum & Chemical Corporation: *See—*
Beiding, William A.; Emenson, Robert B.; and Williams, Raymond L., 3,714,313.
Dorsey, Geoffrey A., Jr., 3,714,000.
Dorsey, Geoffrey A., Jr., 3,714,001.

Kakuda, Satoshi: *See—*
Togiya, Akiyoshi; and Kakuda, Satoshi, 3,713,195.
Kali-Chemie AG: *See—*
Holst, Rudolf; and Hauschild, Ulrich, 3,713,803.
Kaliski, Sylwester. Self-excited electron-phonon resonator. 3,714,604, Cl. 331-107.00a.
Kalopissis, Gregoire: *See—*
Charle, Roger; Kalopissis, Gregoire; and Zviak, Charles, 3,714,049.
Kamijo, Kazuaki: *See—*
Hosoki, Shigeyuki; Okano, Hiroshi; and Kamijo, Kazuaki, 3,714,422.
Kaminaka, Hiroshi: *See—*
Ito, Ken; Kaminaka, Hiroshi; and Oie, Kunihisa, 3,714,269.
Kaminaka, Hiroshi; Tamura, Takashi; and Tanimoto, Kenji, to Sumitomo Chemical Company, Ltd. Process for producing granulated free-flowing 2,6-ditertiarybutyl-4-methylphenol. 3,714,268, Cl. 260-624.00r.
Kamnitsis, Constantine: *See—*
Minton, Robert; and Kamnitsis, Constantine, 3,714,601.
Kanegafuchi Boseki Kabushiki Kaisha: *See—*
Tatsunori, Shikada, 3,714,307.
Kaneko, Hirokazu: *See—*
Shiratory, Yoshitaka; and Kaneko, Hirokazu, 3,713,374.
Kaneko, Tokuzo: *See—*
Sato, Shui; Sakamoto, Eiichi; Saito, Shizuo; Sakazume, Kaiichiro; and Kaneko, Tokuzo, 3,713,835.
Kang, George S., to Bunker-Ramo Corporation, The. Apparatus and methods for deriving in essentially real time continuous electrical representations of the fourier and inverse fourier transform. 3,714,566, Cl. 324-77.00e.
Kansai Paint Company Limited: *See—*
Nakayama, Yasuharu, 3,714,295.
Kanto Ishiseiyaku Co., Ltd.: *See—*
Kondo, Seigo; Tabata, Toshikazu; and Horiuchi, Jiro, 3,714,166.
Kanton, Fred S.: *See—*
Astle, Thomas W., 3,713,985.
Kanzaki Paper Mfg. Co., Ltd.: *See—*
Akiyama, Toyomi; Kondo, Mitsuru; and Dotani, Satoshi, 3,713,881.
Kao Soap Co., Ltd.: *See—*
Matsuda, Kazuo; Tanaka, Yoshiaki; Sakai, Takeyo; and Iwasa, Ichiro, 3,714,266.
Kaplan, Milton. Image reconstitution system. 3,713,730, Cl. 350-320.000.
Karamian, Narbik A. Separatory funnel. 3,713,778, Cl. 23-259.000.
Kariya, Shizuo; Narita, Hiroshi; Tuboi, Takashi; and Takahashi, Tetsuya, to Hitachi, Ltd. Chopper circuit. 3,714,467, Cl. 307-240.000.
Karnemaat, John N. Process for producing garbage based fertilizer. 3,713,800, Cl. 71-14.000.
Karp, Raymond E., to United States of America, Navy. High speed fail safe weapon retarding system. 3,713,387, Cl. 102-4.000.
Kasei, C. I., Co., Ltd.: *See—*
Otsugu, Shozo, 3,713,762.
Kass, Charles L. Cycle valve for filters. 3,713,538, Cl. 210-138.000.
Katell, Abraham, to NL Industries, Inc. Nuclear reactor fuel element. 3,713,975, Cl. 176-79.000.
Kato, Ryuzo, to Matsushita Electronics Corporation. Pick-up tube envelope sealant extending into groove of annulartarget support. 3,714,488, Cl. 313-65.00r.
Kato, Takaaki: *See—*
Sakakibara, Shigeru; Kato, Takaaki; and Ito, Katsunori, 3,713,351.
Katsuyama, Yoshihisa, to Nippon Kogaku K.K. Device for generating a signal synchronous with focusing. 3,714,524, Cl. 250-235.000.
Katz, Robert E. Envelope-containing multiple page pamphlet. 3,713,673, Cl. 281-3.00r.
Katzman, Lawrence; and Briggin, Edward, to Kaz Manufacturing Co., Inc. Vaporizer with thermally isolated heating chamber. 3,714,391, Cl. 219-271.000.
Katzman, Lawrence; and Briggin, Edward, to Kaz Manufacturing Co., Inc. Non-splitting vaporizing unit. 3,714,392, Cl. 219-284.000.
Kawai, Hisasi: *See—*
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, 3,713,355.
Kawanishi, Masazumi: *See—*
Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshio; Kawanishi, Masazumi; Sato, Masanori; Hoshiyama, Masao; and Nagao, Taku, 3,714,171.
Kawasaki, Akihiro; and Maruyama, Isao, to Maruzen Petrochemical Co., Ltd. Process for preparing alternating copolymer of butadiene and α-olefine and novel alternating copolymer of butadiene and α-olefine containing cis-configuration butadiene unit. 3,714,133, Cl. 260-84.100.
Kaye, Melvin S., to Maas & Waldstein Co. Method of depositing metallic flakes. 3,713,870, Cl. 117-71.00r.
Kaye, Robert K.: *See—*
Fuller, Roger L.; Gustafsson, Sven G.; Harris, Derek V.; Kaye, Robert K.; and Oliver, Joseph J., 3,714,650.
Kayle, Jerry P., to Pacific Game Company. Creative magnet apparatus. 3,714,612, Cl. 335-285.000.
Kaz Manufacturing Co., Inc.: *See—*
Katzman, Lawrence; and Briggin, Edward, 3,714,391.
Katzman, Lawrence; and Briggin, Edward, 3,714,392.
Kazanxhian, Grigory Paravonovich: *See—*
Markosian, Marlen Mamukovich; Shermazanian, Yakov Tigranovich; Kazanxhian, Grigory Paravonovich; Avakian, Jury Vardkesovich; and Vartanian, Albert Vartanovich, 3,713,727.
Keenan, John Francis Edmund: *See—*
Beal, Walter; Hobday, Cyril; Jack, James; and Keenan, John Francis Edmund, 3,713,769.
Keene Corporation: *See—*
Carr, Larry R.; and Topol, George J., 3,714,444.
Kehr, Clifton L.; and Wszolek, Walter R., to Grace, W. R., & Co. Chemically curable liquid polyene-polythiol polymer composition. 3,714,290, Cl. 260-858.000.
Keith, Norval A. Apparatus for slitting sheet metal. 3,713,357, Cl. 83-11.000.
Keithley Instruments, Inc.: *See—*
Kime, Robert Clarence; and Miller, Warren Frederick, 3,714,593.
Kell, Ray D., to RCA Corporation. Luminescent screen comprising phosphor cores luminescent in first color and phosphor coatings luminescent in second color. 3,714,490, Cl. 313-92.00r.
Keller, Darryl E.; and Monson, Donald R., to Donaldson Company, Inc. Centrifugal air cleaner with static charge dissipating structure. 3,713,280, Cl. 55-360.000.
Keller, Karlheinz: *See—*
Wegmuller, Hans; and Keller, Karlheinz, 3,713,768.
Keller, Melvin R.: *See—*
Von Ohain, Hans J. P.; and Keller, Melvin R., 3,713,970.
Keller, Toni, to Spectrospin AG. Finely stabilizing the magnetic field of a magnetic nuclear resonance device. 3,714,553, Cl. 324-.50r.
Kelley, Fred W., Jr.; Mishkovsky, Victor; and Singletary, William R., to General Electric Company. Bi-polarity potential transformer for measuring D-C voltage. 3,714,544, Cl. 323-6.000.
Kelling, Geoffrey Philip: *See—*
Hill, Joseph Henry; Kelling, Geoffrey Philip; and Spikes, Roger Hugh, 3,713,714.
Kelly, Fred H.: *See—*
Sawyer, Elbert M.; and Kelly, Fred H., 3,714,450.
Kelly, Joseph D.: *See—*
Stilley, George W.; Wagner, William E.; and Kelly, Joseph D., 3,713,798.
Kelsey-Hayes Company: *See—*
Bogdan, Louis J.; and Culp, Jere S., 3,713,617.
Kendall Company, The: *See—*
Samour, Carlos M.; and Richards, Mildred C., 3,714,256.
Kendall, Giles A., to Menasco Manufacturing Company. Damping apparatus. 3,713,641, Cl. 267-139.000.
Kennedy, William J. L.; Miczek, Charles B.; and Garabedian, George, to Stone & Webster Engineering Corporation. Composite pressure suppression containment structure for nuclear power reactors. 3,713,968, Cl. 176-37.000.
Kenney, John Thomas, to Western Electric Company, Incorporated. Method of and apparatus for the electrochemical treatment of work surfaces. 3,713,998, Cl. 204-15.000.
Kermabon, Andre J.: *See—*
Bordessoule, Rene F.; Kermabon, Andre J.; and De Vera, Serge, 3,713,411.
Kerr, Lamar L., to General Motors Corporation. Viscous fluid clutch. 3,713,520, Cl. 192-58.00b.
Kerr-McGee Corporation: *See—*
Baldwin, Roger A.; and Cheng, Ming T., 3,714,267.
Kerrigan, Charles M.: *See—*
Leidy, Harold T.; Kerrigan, Charles M.; and Byble, Duane C., 3,713,837.
Kershaw, Joseph E., to United States of America, Navy. Method and apparatus for coupling multiple power sources to single radiating antenna. 3,714,661, Cl. 343-858.000.
Kewanee Oil Company: *See—*
Hofstadter, Robert; Kramer, Gerald R.; Farukhi, Mohammed R.; and Rosette, King H., 3,714,057.
Khokhlov, Alexander Semenovich: *See—*
Zarezankov, Georgy Khristovich; Khokhlov, Alexander Semenovich; Cherepnev, Valery Ivanovich; Druzhinin, Nikolai Sergeevich; and Budtolaev, Konstantin Nikolaevich, 3,713,739.
Kibby, Robert M., to Reynolds Metals Company. Alumina reduction cell and improved anode system therein. 3,714,002, Cl. 204-67.000.
Kidde, Walter & Company, Inc.: *See—*
Hansen, Arne, 3,713,493.
Kidde, Walter, & Company, Inc., mesne: *See—*
Gribowski, George J.; Osborne, William B.; and Wilson, Rexford, 3,713,491.
Kiefer, Hans; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted acid anilides. 3,714,252, Cl. 260-562.00r.
Kielsmeier, lester O.; and Leprino, James G., to Leprino Cheese Mfg. Co. Apparatus for mixing cheese curd. 3,713,220, Cl. 99-459.000.
Kiely, Edmond F.: *See—*
Fradenburgh, Evan A.; and Kiely, Edmond F., 3,713,751.
Kiess, Helmut Gustav, to RCA Corporation. Pyroelectric photoconductive elements and method of charging same. 3,713,822, Cl. 96-1.500.
Kikkoman Shoyu Co., Ltd.: *See—*
Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mituharu, 3,713,983.
Kilroy, Eugene J., Jr., to Mattel, Inc. Construction set including headed fastener with shoulder thereon. 3,713,246, Cl. 46-17.000.

Kim, Charles W., to Hercules Incorporated. Nrnwoven fabric and process for preparing. 3,713,942, Cl. 156-252.000.
Kim, Yung Ki, to Dow Chemical Corporation. Fluorosilicone lubricants containing nitrophenyl-substituted organopolysiloxanes. 3,714,044, Cl. 252-49.600.
Kimberly-Clark Corporation: *See—*
Rieter, Robert F., 3,713,629.
Sokolowski, Robert C., 3,713,933.
Kime, Robert Clarence; and Miller, Warren Frederick, to Keithley Instruments, Inc. Synchronous demodulator having an improved driving circuit. 3,714,593, Cl. 329-50.000.
Kimura, Shoji: *See—*
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadawaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 3,714,296.
Kimura, Yutaka; Ariizumi, Yoshio; Masuda, Yutaka; Yamagami, Teruhiro; and Okita, Yasushi, to Nippon Telegraph and Telephone Public Corporation and Oki Electric Industry Co., Ltd. Special service speech transfer equipment for telephone exchange systems. 3,14,378, Cl. 179-18.00b.
Kind, Ronald W., to General Motors Corporation. Fiber optic liquid level indicator. 3,713,338, Cl. 73-293.000.
Kinematics and Controls Corporation: *See—*
Rakucewicz, John J., 3,713,715.
King, Alwyn H.: *See—*
Roberts, John A.; Roberts, Peter R.; King, Alwyn H.; and Danzey, Lee B., 3,713,202.
King, Thomas M.; and Vandersall, L., to Monsanto Company. Methods of inhibiting corrosion with ethane diphosphonate compositions. 3,714,066, Cl. 252-389.00a.
King, Thomas M.; and Mitchell, Robert S., to Monsanto Company. Methods of inhibiting corrosion with condensed polyalkylenepolyamine phosphorates. 3,714,067, Cl. 252-389.00a.
Kingston, Alan Cyril, to Granure Corporation Limited, The, mesne. Thermosettable resin-based mouldable facing compounds. 3,714,113, Cl. 260-40.00r.
Kinsel, Tracy Stewart, to Bell Telephone Laboratories, Incorporated. Optical communication system with PCM encoding with plural discrete unequally spaced intensity levels. 3,714,437, Cl. 250-199.000.
Kirby, Robert A.; and Propst, Billy J., to Esso Production Research Company. Seismic radio telemetry system. 3,714,576, Cl. 325-61.000.
Kirchner, Henry P.: *See—*
Kirchner, Henry P.; Walker, Ralph E.; and Gruver, Robert M., 3,713,877.
Kirchner, Henry P.; Walker, Ralph E.; and Gruver, Robert M., to Kirchner, Henry P. Method of strengthening ceramic bodies and strengthened ceramic bodies produced thereby. 3,713,877, Cl. 117-123.00a.
Kirsch Company: *See—*
Ford, James A., 3,713,473.
Kirsch, Robert P.: *See—*
Murray, James E.; and Kirsch, Robert P., 3,713,600.
Kish, Donald Eugene; and Smith, James Lanson, to Bell Telephone Laboratories, Incorporated. Transfer of magnetic domains in single-wall domain memories. 3,714,639, Cl. 340-174.0tf.
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadawaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, to Denki Kagaku Kogyo Kabushiki Kaisha. Polychloroprene elastomer. 3,714,296, Cl. 260-890.000.
Kitajima, Masao; Kondo, Asaji; and Morishita, Masataka, to Abe, Jinnosuke, Fuji Photo Film Co., Ltd. and Toyo Jozo Co., Ltd. Process for preparing a micro capsule. 3,714,065, Cl. 252-316.000.
Kitano, Akira: *See—*
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, 3,713,355.
Kittredge, Edward D. Electro-optical signal translation. 3,714,446, Cl. 250-219.00d.
Kiwaki, Hisakatsu: *See—*
Kuwabara, Takeo; Kiwaki, Hisakatsu; Sato, Hiroshi; and Onoda, Yoshimitsu, 3,714,541.
Klavsons, Uldis: *See—*
Mutschler, Edward C.; and Klavsons, Uldis, 3,714,665.
Kleiner, Hans-Jerg; and Rossinger, Sigurd, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the preparation of tertiary phosphine oxides using high energy radiation. 3,714,009, Cl. 204-162.0he.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. Antioxidants and age resistant polymeric compositions. 3,714,122, Cl. 260-62.000.
Klingbeil, Werner W.; and Hartman, Eugene H., to Uniroyal, Inc. Tire carcass fabricating method. 3,713,928, Cl. 156-123.000.
Kluger, Jacob N., to Xerox Corporation. Labeling machine. 3,713,948, Cl. 156-351.000.
Knapp, Heinrich; and Schwartz, Reinhard, to Bosch, Robert, G.m.b.H. Fuel injection system. 3,713,430, Cl. 123-139.0aw.
Knechtges, Donald P.; and Antlfinger, George J., to Goodrich, B. F., Company, The. Heat sensitive latices containing silicone polyether. 3,714,101, Cl. 260-29.6rw.
Knothe, Lutz; and Loeblein, Engelbert, to Ramseier & Jenzer A.G. Vehicle body box equipped with at least one sliding door. 3,713,690, Cl. 296-146.000.
Knowles, James: *See—*
Balje, Otto Erich; Bouchard, Constant L.; Knowles, James; Kosacheff, Dimitri; Pulick, Emil A.; Pulick, Michael A.; and Topouzian, Armen, 3,713,294.
Knudsen, Raymond G., to Snap-On Tools Corporation. Socket release mechanism for wrenches and the like. 3,713,356, Cl. 81-177.600.
Knutrud, Leif Brudal. Mold for the production of deepfrozen blocks of food. 3,713,304, Cl. 62-341.000.
Knutsen, Merle E. Therapeutic exercising apparatus. 3,713,438, Cl. 128-25.00r.
Kobayashi, Akihiro, to Nitton Company, Limited. Ionization smoke detector. 3,714,433, Cl. 250-83.6ft.
Kobayashi, Tsuyoshi: *See—*
Okamoto, Tadashi; Kobayashi, Tsuyoshi; and Yamamoto, Hisao, 3,714,148.
Kobe Steel, Ltd.: *See—*
Yoshida, Shoushi; Iwama, Atsuaki; Odada, Takashi; and Suda, Tetsuo, 3,714,321.
Kobel, Erwin H.; and Smith, Harry A., to Dow Chemical Company, The. Arylamine-modified phenolic resole resins. 3,714,121, Cl. 260-51.500.
Kober, Ehrenfried H.: *See—*
Schnabel, Wilhelm J.; Kober, Ehrenfried H.; and Kraus, Theodore C., 3,714,216.
Kobetz, Paul; and Lindsay, Kenneth L., to Ethyl Corporation. Process for producing HF and nitrilotriacetonitrile. 3,714,335, Cl. 423-483.000.
Koch, Erich O.: *See—*
Nurnberg, Richard K.; and Koch, Erich O., 3,714,646.
Koch, Richard C., to Regency Electronics, Inc. Scanning radio having rapid channel skipping capability. 3,714,585, Cl. 325-468.000.
Koehl, Harald: *See—*
Mueller, Herbert; Koernig, Wolfgang; and Koehl, Harald, 3,714,285.
Koepke, Earl H., to General Fireproofing Company, The. Chair cushion and method of making same. 3,713,697, Cl. 297-456.000.
Koerner, Ralph J., to Canoga Controls Corporation. Vehicle detection system. 3,714,626, Cl. 340-38.00l.
Koerner, Roger J.: *See—*
Burkhardt, Joseph A.; Childers, Thomas W.; Tidwell, Danny R.; and Koerner, Roger J., 3,714,384.
Koernig, Wolfgang: *See—*
Mueller, Herbert; Koernig, Wolfgang; and Koehl, Harald, 3,714,285.
Koguro, Masao: *See—*
Enomoto, Satoru; Wada, Hisayuki; Fujioka, Mikio; and Koguro, Masao, 3,714,020.
Kogyo Gijutsuin; a/k/a Industrial Science and Technology, Agency of: *See—*
Komiya, Yoshio; Moll, John L.; and Tarui, Yasuo, 3,714,522.
Koizumi, Takeo: *See—*
Imai, Hirosuke; and Koizumi, Takeo, 3,714,279.
Kojima, Michio: *See—*
Shigezane, Suzu; Naoi, Fusaji; Saito, Seiichi; Kojima, Michio; and Ishida, Ryuichi, 3,714,175.
Kokle, Juris Leovich: *See—*
Apsit, Voldemar Voldemarovich; Kokle, Juris Leovich; Skrutzitis, Karl Ernestovich; and Schukin, Mikhail Ivanovich, 3,714,480.
Kolene Corporation: *See—*
Shoemaker, Robert H.; and Faler, John A., 3,714,016.
Kolling, Heinrich; and Kurz, Jurgen, to Farbenfabriken Bayer Aktiengesellschaft. Production of 2-acyloxy-thionobenzamides. 3,714,231, Cl. 260-477.000.
Kollmorgen Corporation: *See—*
Bruning, Harry F., Jr.; and Blowers, William L., 3,714,569.
Komiya, Yoshio; Moll, John L.; and Tarui, Yasuo, to Kogyo Gijutsuin; a/k/a Industrial Science and Technology, Agency of and Ministry of International Trade and Industry. Semiconductor device having surface electric-field effect. 3,714,522, Cl. 317-235.00r.
Kommandilbolaget T. Sternius Aktiebolag & Co.: *See—*
Sternius, Alf Tommy, 3,714,414.
Kondo, Asaji: *See—*
Kitajima, Masao; Kondo, Asaji; and Morishita, Masataka, 3,714,065.
Kondo, Mitsuru: *See—*
Akiyama, Toyomi; Kondo, Mitsuru; and Dotani, Satoshi, 3,713,881.
Kondo, Seigo; Tabata, Toshikazu; and Horiuchi, Jiro, to Kanto Ishiseiyaku Co., Ltd. Cocarboxylase arginate and process for the production thereof. 3,714,166, Cl. 260-256.50b.
Koninklijke Nederlandsche Hoogovens en Staalfabrieken N.V.: *See—*
Vrijburg, Hans Gerhard; and Bijl, Cornelis Leendert, 3,713,902.
Koninklijke Nederlandsche Hoogovens en Staalfabrienken N.V.: *See—*
Beenhakker, Albertus Hendrik; and Felthuis, Jacob, 3,713,632.
Koninklijke Zwavelzuurfabriken voorheen Ketjen N.V.: *See—*
Maat, Hendrik Jan; and Ber, Andre Lucas, Netherlands, 3,714,072.
Konishiroku Photo Industry Co., Ltd.: *See—*
Sato, Shui; Sakamoto, Eiichi; Saito, Shizuo; Sakazume, Kaiichiro; and Kaneko, Tokuzo, 3,713,835.
Koppers Company, Inc.: *See—*
Baum, Melvin E.; and Hatton, John A., Jr., 3,714,292.
Baum, Melvin E.; and Hatton, John A., Jr., 3,714,293.
Baum, Melvin E.; and Hatton, John A., Jr., 3,714,294.

Koppl, Ernest R.; and Scibbe, Harold R., to TRW Inc. Brake control system with skid control. 3,713,704, Cl. 303-21.00b.

Kornrumpf, William P.: *See—*
Harnden, John D., Jr.; Kornrumpf, William P.; and Marquardt, Robert A., 3,714,508.

Kosacheff, Dimitri: *See—*
Balje, Otto Erich; Bouchard, Constant L.; Knowles, James; Kosacheff, Dimitri; Pulick, Emil A.; Pulick, Michael A.; and Topouzian, Armen, 3,713,294.

Koss, Donald A.: *See—*
Boone, Donald H.; Koss, Donald A.; and Peacock, David E., 3,713,815.

Kosseim, Alexander J.: *See—*
Somekh, George S.; Kubek, Daniel J.; and Kosseim, Alexander J., 3,714,033.

Kosseim, Alexander Jean-Marie; Kubek, Daniel John; and Somekh, George Solomon, to Union Carbide Corporation. Process for the separation of aromatic hydrocarbons from a mixed hydrocarbon feedstock. 3,714,034, Cl. 208-321.000.

Kosubek, Uwe: *See—*
Lowenfeld, Rudolf; and Kosubek, Uwe, 3,713,767.

Krabbe, Erik: *See—*
Delente, Jacques J.; Lueckerath, Elmer W.; Akin, Cavit; and Krabbe, Erik, 3,713,839.

Krabbe, Erik, mesne: *See—*
Delente, Jacques J.; Lueckerath, Elmer W.; Akin, Cavit; and Krabbe, Erik, 3,713,839.

Kraft, Karl-Josef: *See—*
Dahm, Manfred; Kraft, Karl-Josef; and Roegler, Manfred, 3,714,080.

Kramer, Gerald R.: *See—*
Hofstadter, Robert; Kramer, Gerald R.; Farukhi, Mohammed R.; and Rosette, King H., 3,714,057.

Kraus, Theodore C.: *See—*
Schnabel, Wilhelm J.; Kober, Ehrenfried H.; and Kraus, Theodore C., 3,714,216.

Krause, Robert J.: *See—*
Gubernick, Joseph; Krause, Robert J.; Lerner, Amos; and Mosca, Gianni, 3,714,346.

Kreda, Eugene J., to Servo Corporation of America. Photomultiplier gain control circuit. 3,714,441, Cl. 250-207.000.

Kreh, Marvin J.: *See—*
Widiger, Almar T.; and Kreh, Marvin J., 3,713,965.

Krekeler, Ulrich, to Agfa-Gevaert Aktiengesellschaft. Process for the modification of the surface properties of mouldings made of transparent thermoplastic synthetic resins. 3,713,880, Cl. 117-138.80b.

Kremer, Gilbert Victor Henri, to Ugine Kuhlmann. Succinimide-containing dyestuffs. 3,714,184, Cl. 260-326.300.

Krempel, Frank M.: *See—*
Brouwer, Frans; Englehardt, William H.; Krempel, Frank M.; and Payne, Robert A., 3,714,649.

Krivak, Michael T.; Reynolds, Gibson; and Prapis, Frank, to Bendix Corporation, The. Servo displacement limiter with reversing capabilities. 3,714,535, Cl. 318-468.000.

Kroger, Harry: *See—*
Grace, Martin I.; Kroger, Harry; and Pratt, Harold J., Jr., 3,714,605.

Krohmer, Gerhard; and Krohmer, Helmut. Disaster control system. 3,714,456, Cl. 307-117.000.

Krohmer, Helmut: *See—*
Krohmer, Gerhard; and Krohmer, Helmut, 3,714,456.

Kroll, Harry: *See—*
Sykes, Donald J.; Kroll, Harry; and Finch, Theron R., 3,713,826.

Krueger Metal Products, Inc.: *See—*
Hendrickson, Philip J.; and Resch, Richard J., 3,713,618.

Kruger, Harry, G.m.b.H.: *See—*
Scheffer, Harry, 3,713,755.

Krump, Robert C.: *See—*
Donnelly, Donald E.; and Krump, Robert C., 3,713,766.

Kubek, Daniel J.: *See—*
Somekh, George S.; Kubek, Daniel J.; and Kosseim, Alexander J., 3,714,033.

Kubek, Daniel John: *See—*
Kosseim, Alexander Jean-Marie; Kubek, Daniel John; and Somekh, George Solomon, 3,714,034.

Kubicka, Rudolf: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.

Kubik, Philip A. Multiple pressure fluid system. 3,713,291, Cl. 60-52.0vs.

Kubitzek, Alfred: *See—*
Bestenreiner, Friedrich; Deml, Reinhold; Kubitzek, Alfred; and Borowski, Kurt, 3,714,435.

Kuempel, John R.: *See—*
Shults, Wilbur D.; and Kuempel, John R., 3,713,994.

Kuener, Otto: *See—*
Balsam, Gunter; and Kuener, Otto, 3,713,980.

Kuffel, Richard A., to General Mills, Inc. Chiffon cake mix. 3,713,845, Cl. 99-94.000.

Kuhn, Horst: *See—*
Huhn, Helmut; and Kuhn, Horst, 3,714,103.

Kuhn, Richard B., to North American Rockwell Corporation. Apparatus and information processing methods for a tracking system tracker unit. 3,714,373, Cl. 178-6.800.

Kuijk, Karel Elbert; and Hoogendoorn, Abraham, to U.S. Philips Corporation. Transistor amplifier. 3,714,600, Cl. 330-25.000.

Kull, Leo. Mechanically operated merchandise machine. 3,713,562, Cl. 221-125.000.

Kuniyasu, Yoshihiro; Matsumoto, Akio; Isobe, Eiji; and Someno, Kenji, to Mitsui Mining & Smelting Co., Ltd. Method of manufacturing metallic short fibers. 3,713,477, Cl. 164-69.000.

Kuniyasu, Yosihiro; Matsumoto, Akio; Isobe, Eiji; and Honda, Hironobu, to Mitsui Mining & Smelting Co., Ltd. Porous plate made of metal fibers. 3,713,787, Cl. 29-182.200.

Kupsky, George A., to Burroughs Corporation. Display panel including scanning cells and fixed format display cells. 3,714,506, Cl. 315-84.600.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Enomoto, Satoru; Wada, Hisayuki; Fujioka, Mikio; and Koguro, Masao, 3,714,020.
Takahashi, Masaaki; Yamauchi, Takashi; Okuda, Kensuke; and Ito, Akira, 3,714,021.

Kurihara, Makoto; and Akiyama, Hideaki, to Ricoh Co., Ltd. Automatic focusing camera. 3,713,371, Cl. 95-44.00c.

Kurimoto, Masashi; and Hirao, Mamoru, to Hayashibara Company. Process for preparing powdery starch sugars. 3,713,978, Cl. 195-31.00r.

Kurokawa, Kaneyuki: *See—*
Clemetson, Warren Jay; and Kurokawa, Kaneyuki, 3,714,460.

Kurth, Johannes: *See—*
Vogt, Gerd; Kurth, Johannes; and Glaser, Josef, 3,713,478.

Kurti, Alexander, to United Aircraft Corporation. Composite blade for a gas turbine engine. 3,713,752, Cl. 416-219.000.

Kurz, Jurgen: *See—*
Kolling, Heinrich; and Kurz, Jurgen, 3,714,231.

Kurz, Wolfgang G. W.: *See—*
Dawson, Peter S. S.; Kurz, Wolfgang G. W.; Anderson, Moffat; and York, Arthur E., 3,713,988.

Kusters, Norbert L.; and Macmartin, Malcolm P., to Canadian Patents and Development Limited. Detector-demodulator for modulated (reversed) AC and DC signals. 3,714,567, Cl. 324-111.000.

Kuwabara, Takeo; Kiwaki, Hisakatsu; Sato, Hiroshi; and Onoda, Yoshimitsu, to Hitachi, Ltd. Voltage control apparatus for AC generators. 3,714,541, Cl. 322-24.000.

Kuznetsov, Evgeny Mikhailovich: *See—*
Cherkasov, Petr Alexeevich; Kuznetsov, Evgeny Mikhailovich; Averin, Vyacheslav Vasilievich; and Samarin, Alexandr Mikhailovich, 3,713,995.

Kwolek, John P., to Bendix Corporation, The. Process for making semi-metallic arcuate brake lining segments. 3,714,319, Cl. 264-236.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Nakayama, Kiyoshi; and Araki, Kazumi, 3,713,977.

La Torre, Augustin: *See—*
Gordon, Philip L.; and La Torre, Augustin, 3,713,868.
Gordon, Philip L.; and La Torre, Augustin, 3,714,078.

Labana, Santokh S.; and Chang, Yun Feng, to Ford Motor Company. Composition and method of increasing the reaction rate between an epoxy resin and an aromatic amine. 3,714,120, Cl. 260-47.0ec.

Labatt, John, Limited: *See—*
Quittenton, Richard C., 3,713,840.

Labofina, Soc. An.: *See—*
de Radzitzky d'Ostrowick, Pierre Marie Joseph Ghislain; and de Roocker, Alain Joseph Guillaume, 3,714,215.

Lace, Melvin A., to Motorola, Inc. Brush wear inhibitor for dynamoelectric machines. 3,714,482, Cl. 310-228.000.

Lafferty, William J.: *See—*
Roelofs, Henry M.; and Lafferty, William J., 3,713,475.

Lagadec, Isidore: *See—*
Betremieux, Pierre Arthur; Feissel, Henri Gerard; Gallard, Jean Hilaire; and Lagadec, Isidore, 3,713,885.

Lagemann, Klaus, to U.S. Philips Corporation. Multiple-input bistable multivibrator. 3,714,472, Cl. 307-291.000.

Laguerre, Leon Ker, to Minigrip Inc., mesne. Method of assembling slider with a profiled strip separable fastener. 3,713,923, Cl. 156-66.000.

Laike, Eero. Device for the cooling and preliminary treatment of milk fresh from the cow. 3,713,218, Cl. 99-151.000.

Laitram Corporation: *See—*
Lapeyre, James M., 3,714,657.

Lakomsky, Viktor Iosifovich: *See—*
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,714,368.

Lamont, Peter, to Dow Corning Corporation. Pelletized silicone rubber. 3,714,204, Cl. 260-373.00b.

Lancy, Leslie E.; and Wittmann, Ivan E., to Dart Industries, Inc. Treatment of waste metal processing solution spillage. 3,714,039, Cl. 210-60.000.

Landis, Donald H.; and Pfaff, Richard C., to Epic Metals Corporation. Building construction. 3,713,261, Cl. 52-289.000.

Langford, Donald Campbell. Aerosol spray actuating device. 3,713,565, Cl. 222-180.000.

Langley, Kenneth Richard, to United Kingdom of Great Britain and Northern Ireland, Minister of Aviation Supply in Her Majesty's Government of the. Gas turbine ducted fan engine. 3,713,748, Cl. 415-77.000.

Langmead, Edmund Clarence; and De Wane, Gerald, to Chicago, Bridge & Iron Company. Converter vessel with oval trunnion ring. 3,713,638, Cl. 266-36.00p.

Lantos, Ivan, to American Cyanamid Company. 2-Aryl-5,10-diphenylphenanthro (9,10-D)azoles. 3,714,181, Cl. 260-309.600.

Lapeyre, James M., to Laitram Corporation. Method and apparatus for position location using angle encoding. 3,714,657, Cl. 343-106.00r.

Lapointe, Gabriel M., to Parker Manufacturing Company. Rivet gun. 3,713,321, Cl. 72-391.000.

Laprade, Bernard; Laprade, Xavier; and Gele, Pierre. Multicylinder carburetor. 3,713,630, Cl. 261-23.00a.

Laprade, Xavier: *See*—
Laprade, Bernard; Laprade, Xavier; and Gele, Pierre, 3,713,630.

Larkin, Melvyn W.; and Matta, Richard K., to Westinghouse Electric Corporation. Method of delineating small areas as in microelectronic component fabrication. 3,713,911, Cl. 148-187.000.

Larsen, Eric R.; McKendry, Lennon H.; and Edamura, Fred Y., to Dow Chemical Company. Haloalkoxy- and haloalkylthio-phenyl carbamates. 3,714,233, Cl. 260-479.00c.

Larson, Richard A. N.: *See*—
Johnson, Clifford T.; Neuhaus, Herbert M.; Silver, Wallace E.; Whiting, Gordon D.; and Larson, Richard A. N., 3,713,361.

Larsson, Karl Olof, to Manner, Olof, AB. Copper-zinc-alloy. 3,713,814, Cl. 75-156.500.

Lasher, Edward A., to Whittaker Corporation. High temperature polyester coating. 3,714,090, Cl. 260-21.500.

Lasher, Edward A., to Whittaker Corporation. Oil-containing polyester coating. 3,714,091, Cl. 260-21.000.

Latash, Jury Vadimovich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Baglai, Vitaly Mikhailovich; and Alferov, Jury Fedorovich, 3,713,476.

Lauerer, Uta: *See*—
Wolfle, Rudolf; Rucker, Dieter; and Lauerer, Uta, 3,713,913.

Laurenson, Laurence; and Holland, Leslie Arthur, to British Oxygen Company Limited, The. Vacuum pumps. 3,713,754, Cl. 417-49.000.

Lavarenne, Jean, to Societe Nationale Industrielle Aerospatiale. Device for detecting the speeds of moving bodies. 3,714,642, Cl. 340-263.000.

Laven, Rolf. Counting mechanisms. 3,714,400, Cl. 235-117.00r.

Lavo, Harry F.; and Cante, Charles J., to General Foods Corporation. Plant husbandry. 3,713,404, Cl. 111-1.000.

Lavric, Drago, to Western Electric Company, Incorporated. Methods of metal coating articles. 3,713,876, Cl. 117-102.00m.

Law, Malcolm John; and Jones, Horace, to Permalite Chemicals Limited. Electrodeposition of chromium. 3,713,999, Cl. 204-51.000.

Lawrence, Kenneth C.; and Mills, James B., to Aluminum Company of America. Venting closure. 3,713,545, Cl. 215-56.000.

Lawrenson, Jack, to Pilkington Brothers Limited. Manufacture of flat glass. 3,713,797, Cl. 65-91.000.

Lazet, Frank J., to Philadelphia Quartz Company. Apparatus for liquid separation by flash distillation. 3,713,990, Cl. 202-185.000.

Le Martret, Odile: *See*—
Clemence, Francois; and Le Martret, Odile, 3,714,163.

Leach, John Harold: *See*—
Tolworthy, Robert Theodore; and Leach, John Harold, 3,714,546.

Leathen, William W.: *See*—
Bunting, Pamela M.; and Leathen, William W., 3,713,976.
Bunting, Pamela M.; and Leathen, William W., 3,713,984.

LeBaron, Chester A., to Dessau, Maurice S., Co., Inc. Diamond tool. 3,713,431, Cl. 125-39.000.

Leclerco, Jacques; and Reide, Louis, to Societe Hispano-Suiza/Lallemant. Retractable landing gear. 3,713,608, Cl. 244-102.00r.

Lecouffe, Yves Jacques Felix, to Societe des Accumulateurs Fixes et de Traction, Societe Anonyme. Process for the fixing of the relative charging states of the electrodes of an alkaline storage cell. 3,713,889, Cl. 136-6.000.

Ledex, Inc.: *See*—
Mohler, David Brian, 3,714,518.

Lee, Art, to General Electric Company. Housing assembly of modular construction for solid state relays with plurch external terminals. 3,714,515, Cl. 317-118.000.

Lee, Chune: *See*—
Nixen, David; and Lee, Chune, 3,714,370.

Lee, John T. M., to ICI America, Inc. High-pressure, explosively-actuated spool valve. 3,713,458, Cl. 137-312.000.

Lee, Kenneth M.: *See*—
Campbell, James K.; and Lee, Kenneth M., 3,714,287.

Leeds, Donald H., to Ducommun Incorporated. Composite product and method of making same. 3,713,865, Cl. 117-46.0cc.

Leggett & Platt Incorporated: *See*—
Hougland, Oscar, 3,713,181.

Lehureau, Jean: *See*—
Borrel, Philippe; and Lehureau, Jean, 3,714,007.

Leidy, Harold T.; Kerrigan, Charles M.; and Byble, Duane C., to General Foods Corporation. Freeze-thaw cycle for juicy sausage analog. 3,713,837, Cl. 99-17.000.

Lejeune, Regis: *See*—
Mottez, Paul; and Lejeune, Regis, 3,714,053.

Lek Trol Incorporated: *See*—
Reviel, Benny L., 3,713,302.

Leland, Ragnvald G. Mop with interchangeable heads. 3,713,184, Cl. 15-229.00b.

Lemanski, Chester G., to Mobil Oil Corporation. Thiadiazole hydrazones as fungicides. 3,714,358, Cl. 424-270.000.

Lemmrich, Jurgen: *See*—
Reiniger, Friedrich; von Hacht, Reinhard; and Lemmrich, Jurgen, 3,714,427.

Lengnick, Guenther Fritz, to Stauffer-Wacker Silicone Corporation. Cobalt-platinum catalyst. 3,714,212, Cl. 260-448.20e.

Lenhard, Myron J.: *See*—
Hagenbach, Robert J.; and Lenhard, Myron J., 3,713,819.

Lentz, Thomas Phillip, to M T S Systems Corporation. Axle test device. 3,713,330, Cl. 73-93.000.

Leonard, James H.; and Quick, Richard C., to Square D Company. Key operated electric circuit breaker. 3,714,383, Cl. 200-44.000.

Leprino Cheese Mfg. Co.: *See*—
Kielsmeier, lester O.; and Leprino, James G., 3,713,220.

Leprino, James G.: *See*—
Kielsmeier, lester O.; and Leprino, James G., 3,713,220.

Lepselter, Martin Paul; and MacRae, Alfred Urquhart, to Bell Telephone Laboratories, Incorporated. High resolution shadow masks and their preparation. 3,713,922, Cl. 156-16.000.

Lerche-Svendsen, Flemming, to Aktieselskabet Fibertex. Method for producing a non-woven fabric. 3,713,931, Cl. 156-148.000.

Lerner, Amos: *See*—
Gubernick, Joseph; Krause, Robert J.; Lerner, Amos; and Mosca, Gianni, 3,714,346.

Lerner, Irwin; and McGrath, Robert Paul, to Hoffmann-La Roche Inc. Medazepam and propantheline composition. 3,714,355, Cl. 424-244.000.

Lerner, Sidney I., to Ethyl Corporation. Reducing abnormally high plasma lipid levels in mammals with phenals. 3,714,365, Cl. 424-330.000.

Leroux, Adrien: *See*—
Delisle, Jules; Deschenes, Pierre A.; and Leroux, Adrien, 3,714,453.

Les Laboratoires Millot: *See*—
Rips, Richard, 3,714,250.

Lesko, Frank J., to Reynolds Metals Company. Apparatus for and method of forming a tubular metal blank into a tapered tube on a tapered mandrel. 3,713,318, Cl. 72-283.000.

Leslie, Andrew O., Jr. Breath testing device. 3,713,434, Cl. 128-2.00c.

Letter, Eugene C., to Bausch & Lomb Incorporated. Electrosensitive recording media. 3,713,996, Cl. 204-2.000.

Lever Brothers Company: *See*—
Skinner, Derick Charles, 3,713,577.

Leverich, Charles T., to Cooke Engineering Company, The. Multi-conductor switch for developing patch fields and test boards. 3,714,385, Cl. 200-51.100.

Levin, Nathan. Stop motion apparatus for knitting machines. 3,713,308, Cl. 66-163.000.

Levrini, Tullio; and Corti, Giuseppe. Process to form elements under pressure. 3,713,930, Cl. 156-147.000.

Lewis, Charles W.; and Hann, Everette O., to United States of America, Army. Continuous process for manufacture of nitrocellulose. 3,714,143, Cl. 260-220.000.

Lewis, David, to Chrysler United Kingdom Limited. Press tool assemblies. 3,713,574, Cl. 228-3.000.

Lewis, Roger G. Digitally controlled phase shifter. 3,714,589, Cl. 328-155.000.

Liang, Charles C., to Mallory, P. R., & Co., Inc. Electrolyte materials for high voltage solid electrolyte battery systems. 3,713,897, Cl. 136-153.000.

Libby, Ross C.: *See*—
Mason, Edwin E.; and Libby, Ross C., 3,714,549.

Licentia Patent-Verwaltungs G.m.b.H.: *See*—
Nurnberg, Werner; and Hanitsch, Rolf, 3,714,483.

Lichman, Nikolai Iosifovich: *See*—
Tobak, Lev Zeilikovich; Shterman, Semen Abramovich; Brandenburgsky, Mikhail Galileevich; Lichman, Nikolai Iosifovich; and Lugovskoi, Andrei Lukyanovich, 3,713,198.

Lichte, Henry P., Jr.; and Schultze, Edward F. Gas flow regulator for wellbore catalytic heaters. 3,713,482, Cl. 166-59.000.

Lichtenauer, Gerd, to Hurth, Carl Maschinen-und Zahnradfabrik. Toothed tool for an apparatus for the chipless generation of gears. 3,713,316, Cl. 72-102.000.

Lichtenwalter, Myrl; and Austin, Thomas Howard, to Jefferson Chemical Company, Inc. Production of linear polyethylene polyamines. 3,714,259, Cl. 260-593.00p.

Lien, Suei-Yuen Paul, to Western Electric Company, Incorporated. Method of and apparatus for growing crystals from a solution. 3,713,883, Cl. 117-201.000.

Lienhard, Klaus; and Ulmschneider, Dieter, to Suddeutsche Kalkstickstoff-Werke AG. Process for the production of polyvinylidene fluoride in the presence of a peroxydisulfate initiator at an acidic pH. 3,714,137, Cl. 260-91.100.

Lillestrand, Robert L.; and Carroll, Joseph E., to Control Data Corporation, mesne. Astronomic survey apparatus and method. 3,713,740, Cl. 356-141.000.

Lilly, Eli, and Company: *See*—
Pfeiffer, Ralph R.; and Yang, Kuo Shang, 3,714,154.

Lin, Chao-Han; and Wright, Arthur J., to National Cash Register Company, The. Mark-forming record materials and process. 3,713,863, Cl. 117e36.200.

Lincoln, Frank H.; Schneider, William P.; and Spero, George B., to Upjohn Company, The. Therapeutic compositions comprising a 6α, 9α-difluoro-11β17α, 21-trihydroxy-16α-methyl-1,4-pregnadiene-3,20-dione and 21-acylates. 3,714,353, Cl. 424-243.000.

Lindholm, Robert Derwood; and Hollister, Kenneth Robert, to Eastman Kodak Company. Preparation of silver salts in an organic liquid medium. 3,713,833, Cl. 96-114.000.

Lindo, Neil A.: *See—*
Zinnes, Harold; Lindo, Neil A.; and Shavel, John, Jr., 3,714,155.

Lindsay, Kenneth L.: *See—*
Kobetz, Paul; and Lindsay, Kenneth L., 3,714,335.

Lindsey, Carl B.; and McKenzie, Joe A., to United States of America, Navy. Linear pulse counter apparatus. 3,714,587, Cl. 328-41.000.

Link, William T.; and Hatch, Laurie G., to Applied Radiation Corporation. Method and apparatus for irradiation treatment of elongate materials. 3,714,416, Cl. 250-49.5te.

Linton, Robert W.: *See—*
Miller, James R.; Pierce, Richard H.; Linton, Robert W.; and Wills, John H., 3,714,068.

Lion Fat & Oil Co., Ltd.: *See—*
Nagayama, Masuzo; and Okada, Hiroshi, 3,714,238.

Lippke, Paul. Apparatus for ascertaining and evaluating the transverse profile of the moisture content of moved webs of paper and the like. 3,713,966, Cl. 162-263.000.

Lipschutz, Paul, to Societe d'Exploitation des Brevets Neiman. Safety belts with deceleration release control. 3,713,506, Cl. 180-82.000.

L.I.R.-S.p.A.-Laboratorio Italiano Ricerche: *See—*
Francia, Giovanni, 3,713,364.

Lisotto, Ermete C.: *See—*
Forshey, David R.; and Lisotto, Ermete C., 3,713,918.

Litkenhus, John R.: *See—*
Forrest, James S.; Litkenhus, John R.; and Steger, Donald J., 3,713,524.

Litman, Alan L. Light pulse burglar alarm. 3,714,647, Cl. 340-416.000.

Litton Systems, Inc.: *See—*
Erickson, Fred W., 3,714,501.

Lloyd, Norman Cecil: *See—*
Chandra, Grish; Owen, William John; Lloyd, Norman Cecil; and Cooper, Bryan Ewart, 3,714,118.

Lockheed Aircraft Corporation: *See—*
Marks, Burton S.; and Chiesa, Peter J., Jr., 3,714,119.

Lodding Engineering Corporation: *See—*
Grenier, John E., 3,713,610.

Loeblein, Engelbert: *See—*
Knothe, Lutz; and Loeblein, Engelbert, 3,713,690.

Lohe, Konrad: *See—*
Mundlos, Eberhard; Mohr, Reinhard; and Lohe, Konrad, 3,713,770.

Long, Bobby R., 25% to Guerriero, Joe D. Lead sleeve cutter. 3,713,216, Cl. 30-90.400.

Los, Marinus, to American Cyanamid Company. Ethylenedioxy derivatives of substituted naphthalenone compounds. 3,714,195, Cl. 260-340.900.

Loshaek, Samuel: *See—*
Stehle, Peter Fallon; Wu, Chan K.; Loshaek, Samuel; and Dickstein, Jack, 3,714,105.

Lovecy, Albert Leonard, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the. Electroexplosive devices. 3,713,385, Cl. 102-28.00r.

Lovelock, James E.: *See—*
Josias, Conrad S.; Bowman, Lloyd D.; and Lovelock, James E., 3,714,421.

Lowenfeld, Rudolf; and Kosubek, Uwe, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for dyeing of textile material of mixtures of polyester fibers and cellulose fibers. 3,713,767, Cl. 8-21.00c.

Lozanski, Walter R., to Dri-Frac Limited. Explosive fracturing and propping of petroleum wells. 3,713,487, Cl. 166-280.000.

LTV Electrosystems, Inc.: *See—*
Duff, Billy E.; and Taliaferro, Gerald R., 3,714,610.

Lubart, Eneil D.: *See—*
Agusta, Benjamin; and Lubart, Eneil D., 3,713,908.

Lubrizol Corporation, The: *See—*
Greenough, Paul E., 3,714,042.

Lubsen, Timothy A.; Joffe, Frederick M.; Gregory, Paulee; and McSwiggin, Joseph R., to Procter & Gamble Company, The. Agglomeration of roast and ground coffee with instant coffee solubles. 3,713,842, Cl. 99-65.000.

Lucas, Jeffrey H., to Associated Electric Industries, Limited. Specimen stages for electron microscopes. 3,714,423, Cl. 250-49.50r.

Lucci, Donald E. Cabinet construction. 3,713,718, Cl. 312-263.000.

Ludwig, Louis. Apparatus for improving the grounding connection for an electrical unit. 3,714,614, Cl. 339-14.00r.

Lueckerath, Elmer W.: *See—*
Delente, Jacques J.; Lueckerath, Elmer W.; Akin, Cavit; and Krabbe, Erik, 3,713,839.

Lugovskoi, Andrei Lukyanovich: *See—*
Tobak, Lev Zeilikovich; Shterman, Semen Abramovich; Brandenburgsky, Mikhail Galileevich; Lichman, Nikolai Iosifovich; and Lugovskoi, Andrei Lukyanovich, 3,713,198.

Lukacs, Michael Edward, to Bell Telephone Laboratories, Incorporated. Dynamic focus correction apparatus for a rectilinearly raster scanned electron beam. 3,714,505, Cl. 315-31.000.

Lund, Jon A. Chain saw brush cutting accessory. 3,713,466, Cl. 83-790.000.

Lundin, Charles E., to Colorado Springs National Bank. Method and composition for incorporating additives into molten metal. 3,713,813, Cl. 75-135.000.

Lussling, Theodor; Theissen, Ferdinand; and Wolfgang, Offenbach, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of oxamide. 3,714,251, Cl. 260-561.00k.

Luthe, Fred J., to Fisher Controls Company, Inc. Metal seal for a control valve or the like. 3,713,660, Cl. 277-206.00r.

Luthman, Paul A.; Stein, Maria; and Fischer, Thomas R., to Avco Corporation. Mud guard for tandem axle assembly. 3,713,661, Cl. 280-104.50r.

Luthy, Walter, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Guiding apparatus for controlling rectilinearly movable part of a machine tool. 3,713,746, Cl. 408-8.000.

Lyness, Warren I., to Procter & Gamble Company, The. Mono- and diphthalimido derivatives and their use in detergent and bleach compositions. 3,714,151, Cl. 260-240.0ca.

Lyon, Zeno G., to International Telephone and Telegraph Corporation. Non-cooperative collision avoidance system. 3,714,651, Cl. 343-9.000.

M L W-Worthington, Limited: *See—*
Parker, John Henry; and McInerney, Frank Thomas, 3,713,397.

M T S Systems Corporation: *See—*
Lentz, Thomas Phillip, 3,713,330.

Maag Gear Wheel & Machine Company: *See—*
Meyer, Albert; Wenger, Otto; and Maag, Oskar, 3,713,315.

Maag, Oskar: *See—*
Meyer, Albert; Wenger, Otto; and Maag, Oskar, 3,713,315.

Maas & Waldstein Co.: *See—*
Kaye, Melvin S., 3,713,870.

Maat, Hendrik Jan; and Ber, Andre Lucas, Netherlands, to Koninklijke Zwavelzuurfabriken voorheen Ketjen N.V. Process for the preparation of catalysts containing crystalline aluminosilicate zeolites. 3,714,072, Cl. 252-451.000.

Mac Cragh, Adolfo P.; Patil, Arvind S.; and Ashby, George E., to Grace, W. R., & Co. Process for preparing tungsten-silica cermets. 3,713,816, Cl. 75-206.000.

MacCabee, Bruce Sargent. Simple, self-protected photoelectric eye circuitry. 3,714,440, Cl. 250-206.00r.

Macey, Frank G.; and Reif, Robert H., to Sylvania Electric Products, Inc. Information processing system. 3,714,397, Cl. 235-61.11e.

Macey, Frank G., to Servo Corporation of America, mesne. Amplifier circuit having a controllable gain. 3,714,602, Cl. 330-86.000.

MacGeorge, William D., to Testing Technology Corporation. Force measuring apparatus. 3,713,333, Cl. 73-141.00a.

MacManus, John. Whipping apparatus and method. 3,713,841, Cl. 99-60.000.

Macmartin, Malcolm P.: *See—*
Kusters, Norbert L.; and Macmartin, Malcolm P., 3,714,567.

MacRae, Alfred Urquhart: *See—*
Lepselter, Martin Paul; and MacRae, Alfred Urquhart, 3,713,922.

Macrander, Max S., to GTE Automatic Electric Laboratories, Incorporated. D.C. Compensation circuit for miniature transformers. 3,714,548, Cl. 323-48.000.

Mactaggart, Scott & Company, Limited: *See—*
Matthew, John Campbell, 3,713,609.

Madden, Thomas Raymond: *See—*
Bayha, Charles Edward; and Madden, Thomas Raymond, 3,714,257.
Bayha, Charles Edward; and Madden, Thomas Raymond, 3,714,258.

Madland, Robert C., to Illinois Tool Works, Inc. Solid state switch construction. 3,714,611, Cl. 335-229.000.

Madsen, Rud Frik; and Jensen, Jens Herman, to Aktieselskabet de Danske Sukkerfabrikker. Pressure transducer. 3,713,341, Cl. 73-406.000.

Maeda, Katsumi: *See—*
Suzuki, Hidenori; Iizaka, Isao; Horie, Yoshihiro; Maeda, Katsumi; and Inagaki, Shotaro, 3,713,737.

Maeda, Kazuo: *See—*
Fujiwara, Ryozo; Ohaha, Eiji; Maeda, Kazuo; Terada, Fumio; Sugino, Toshiyuki; Arakane, Hiroyasu; and Watanabe, Yoshimoto, 3,714,340.

Magi, Hugo, to Dominion Auto Accessories Limited. Truck mirrors. 3,713,726, Cl. 350-288.000.

Magnavox Company, The: *See—*
Close, Ernest Frederick, 3,714,580.

Maher, James Bernard; Delahunty, Terry Wayne; and Patton, Edmond Louis, to Chicago Bridge & Iron Company. Direct contact liquid gasifier and method. 3,713,794, Cl. 48-190.000.

Maillard, Poland: *See—*
Vogt, Kurt; and Maillard, Poland, 3,713,287.

Maille, Claude, to Stein Industries. Refuse destructor. 3,713,403, Cl. 110-32.00r.

Majoie, Bernard, to Societe de Recherches Industrielles S.O.R.I. Process for the preparation of 2,3-dibromofuran. 3,714,197, Cl. 260-346.10r.

Makower, Samuel J.: *See—*
Cautilli, Philip A.; and Makower, Samuel J., 3,714,097.

Maley, James John, to RCA Corporation. Method for preparing a conductive coating on a glass surface. 3,713,884, Cl. 117-211.000.

Malikov, Fatkulla Khairullovich: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.

Mallette, Gertrude E., to Barnard, Leonard. Disposable bedpan. 3,713,178, Cl. 4-112.000.

Mallinckrodt Chemical Works: *See—*
Brown, James L., 3,714,344.

Mallinger, Morton A.: *See—*
Fast, Clarence R.; and Mallinger, Morton A., 3,713,489.

Mallion, Keith Blakeney; Turner, Ralph William; and Todd, Alexander Henry, to Imperial Chemical Industries Limited. Morpholine derivatives. 3,714,161, Cl. 260-247.70c.

Mallory, P. R., & Co., Inc.: *See—*
Curelop, Edward J.; and Marincic, Nikola, 3,713,891.
Liang, Charles C., 3,713,897.

Malmin, Oscar. Root canal instrument. 3,713,221, Cl. 32-57.000.

Malmstrom, Sven-Erik: *See—*
Derman, Karl Gustav Einar; and Malmstrom, Sven-Erik, 3,713,659.

Mancini, Corrado; and Gaspari, Raffaele, to Societa' Italiana Resine S.p.A. Process for making ethylene polymers or copolymers in a pressure-pulsed tubular reactor. 3,714,123, Cl. 260-63.00r.

Manfredonia, Abraham: *See—*
Clark, Kenneth G.; Cook, Thomas J.; De Pass, Ernest T.; and Manfredonia, Abraham, 3,713,954.

Manhardt, John R., to Itek Corporation. Physical development utilizing 1-phenyl-3-pyrazolidone or a benzene diamine combined with a polyhydroxybenzene in acidic medium. 3,713,824, Cl. 96-48.0pd.

Manly, Ron. Automatic editing method with page formatting. 3,714,636, Cl. 340-172.500.

Manner, Olof, AB: *See—*
Larsson, Karl Olof, 3,713,814.

Mannesmann Aktiengesellschaft, Firma: *See—*
Vogt, Gerd; Kurth, Johannes; and Glaser, Josef, 3,713,478.

Manning, Jmes H., to Imperial Paper Company. Process for the production of latex coated cyanamide-formaldehyde modified cellulosic pulp fibers. 3,714,088, Cl. 260-17.300.

Manning, Robert E., to Sandoz-Wander, Inc. Substituted amino guanidine as anti-diabetic agents. 3,714,363, Cl. 424-326.000.

Mannix Co., Ltd.: *See—*
Colius, Helmut Gustav, 3,713,396.

Mannorth Service Corporation: *See—*
Hoffmann, William D., 3,713,596.

Mansfield Aircraft Products Co.: *See—*
Arnett, Hager F.; and Smith, Reginald A., 3,713,377.

Manz, Ulrich: *See—*
Gutmann, Hugo; Manz, Ulrich; and Schwieter, Ulrich, 3,714,367.

Marason, Gabriel, Jr. Spin pole doll accessory. 3,713,251, Cl. 46-132.000.

Marchbank, Frederick Albert Leslie: *See—*
McIver, Robert Faulds; and Marchbank, Frederick Albert Leslie, 3,713,459.

Marconi, Joseph. Printed circuit card retainer and rack assembly. 3,714,513, Cl. 317-101.0dh.

Margan, Gerard E., to Riddell, Inc. Energy absorbing and sizing means for helmets. 3,713,640, Cl. 267-117.000.

Maria Mes, Johannes Antonius, to U.S. Philps Corporation. Electro-optical modulation apparatus using a square-wave signal. 3,713,722, Cl. 350-150.000.

Marincic, Nikola: *See—*
Curelop, Edward J.; and Marincic, Nikola, 3,713,891.

Marion, Frank A.; and Mc Spadden, Hugh J., to Universal Propulsion Co. Insulating material. 3,714,047, Cl. 252-62.000.

Mark, Andre. Pneumatic driers. 3,713,225, Cl. 34-10.000.

Markosian, Marlen Mamukovich; Shermazanian, Yakov Tigranovich; Kazanxhian, Grigory Paravonovich; Avakian, Jury Vardkesovich; and Vartanian, Albert Vartanovich, to Erevanskoe otdelenie vsesojuz-nogo proektnoissledovatelsko-go proekton-konstruktorskogo i-teknologicheskogo institutakabelnoi promyshlennosti. Solar unit. 3,713,727, Cl. 350-292.000.

Marks, Burton S.; and Chiesa, Peter J., Jr., to Lockheed Aircraft Corporation. Zinc-siloxane polymer and coating and method for making the same. 3,714,119, Cl. 260-46.50e.

Marquardt, Robert A.: *See—*
Harnden, John D., Jr.; Kornrumpf, William P.; and Marquardt, Robert A., 3,714,508.

Marsan, Arthur E. Sealing ring or pad for a post-surgical drainage pouch. 3,713,445, Cl. 128-283.000.

Marsden, Howard A.: *See—*
Haak, Williard J.; and Marsden, Howard A., 3,713,295.

Marsh, Paul G.: *See—*
Blakley, Earl T.; Chupka, David E.; Harbron, Donald L., Jr.; Marsh, Paul G.; and Seifert, Peter, 3,713,594.

Marsh, Paul G., to Black Clawson Company, The. Process and product for converting organic materials by pyrolysis or hydrogenation. 3,714,038, Cl. 210-59.000.

Martel, Jacques; and Buendia, Jean, to Roussel-UCLAF. Novel cyclopropanecarboxylic acids. 3,714,153, Cl. 260-240.00r.

Martens, Gerhard: *See—*
Hess, Gunther; Martens, Gerhard; and Pohl, Kurt, 3,713,784.

Martin, James W., Jr.: *See—*
Thompson, Larry O.; Gilbert, William J.; Thompson, Louis R.; Martin, James W., Jr.; and Clements, William Lamar, 3,713,554.

Martin, Jerry Roy; and Goldstein, Alma W., to Abbott Laboratories. Erythromycine. 3,714,142, Cl. 260-210.00e.

Martin, Peter. Foot support for shower baths. 3,713,180, Cl. 4-185.000.

Marty, Fred C. Revolvable device for aiding the movement of a partially disabled person. 3,713,619, Cl. 248-425.000.

Maruyama, Isao: *See—*
Kawasaki, Akihiro; and Maruyama, Isao, 3,714,133.

Maruyama, Takeji; and Uenae, Tadao, to Iwatani & Co., Ltd. Fuel gas composition. 3,713,793, Cl. 44-52.000.

Maruzen Petrochemical Co., Ltd.: *See—*
Kawasaki, Akihiro; and Maruyama, Isao, 3,714,133.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Coated glass fiber strands. 3,713,871, Cl. 117-72.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Simon, Michael, 3,713,293.

Maschinenfabrik Gehring KG: *See—*
Morgan, Robert A.; and Rishel, Paul A., 3,714,619.

Mason, Edwin E.; and Libby, Ross C., to Design Elements, Inc. Temperature compensation circuit for a regulated power supply. 3,714,549, Cl. 323-22.00t.

Mason, Edwin E. Modem carrier detecting circuit. 3,714,586, Cl. 325-487.000.

Mason, Henry J.; and Jones, Geoffrey A. Learning aid for the handicapped. 3,713,228, Cl. 35-35.00a.

Massachusetts Institute of Technology: *See—*
Epstein, David J.; and Bullock, David C., 3,714,633.

Massie, Stephen N., to Universal Oil Products Company. Preparation of esters. 3,714,228, Cl. 260-476.00r.

Masuda, Hideaki: *See—*
Chiba, Hiroyuki; Masuda, Hideaki; and Hirota, Eiichi, 3,713,193.

Masuda, Yutaka: *See—*
Kimura, Yutaka; Ariizumi, Yoshio; Masuda, Yutaka; Yamagami, Teruhiro; and Okita, Yasushi, 3,714,378.

Matherly, James E.; and Hays, William R., to Dow Corning Corporation. Primer adhesion promoter and primer composition. 3,714,109, Cl. 260-32.8sb.

Mathewson, Wilfred F., Jr.: *See—*
Wright, Archibald N.; and Mathewson, Wilfred F., Jr., 3,713,874.

Matino, Haruhiro. Method for manufacturing a semiconductor device. 3,713,910, Cl. 148-186.000.

Matson, Rapheal F., to Freeport Mineral Company. Recovery of nickel and cobalt from reduced nickeliferous ores. 3,714,326, Cl. 423-150.000.

Matsubara, Takashi: *See—*
Okada, Yoshihiko; and Matsubara, Takashi, 3,714,244.

Matsuda, Kazuo; Tanaka, Yoshiaki; Sakai, Takeyo; and Iwasa, Ichiro, to Kao Soap Co., Ltd. Process for polymerization of tetrahydrofuran. 3,714,266, Cl. 260-615.00b.

Matsuda, Ryoichi; and Terai, Masaaki, to Nippon Telegrpah Public Corporation. Noninductive anti-sidetone circuit. 3,714,381, Cl. 179-81.00a.

Matsumoti, Masaki: *See—*
Yazawa, Masahide; Tani, Haruhisa; Matsumoti, Masaki; and Sasaki, Yasuo, 3,713,190.

Matsumoto, Akio: *See—*
Kuniyasu, Yoshihiro; Matsumoto, Akio; Isobe, Eiji; and Someno, Kenji, 3,713,477.
Kuniyasu, Yoshihiro; Matsumoto, Akio; Isobe, Eiji; and Honda, Hironobu, 3,713,787.

Matsuo, Yoshihiro; Sasaki, Hiromu; and Hayakawa, Shigeru. Ceramic dielectric materials of perovskite barium-lead sodium niobate. 3,713,853, Cl. 106-39.500.

Matsushita Electric Industrial Co., Ltd.: *See—*
Chiba, Hiroyuki; Masuda, Hideaki; and Hirota, Eiichi, 3,713,193.
Takeyama, Kojiro; and Onishi, Hajime, 3,713,226.
Uchida, Kosaku, 3,714,469.

Matsushita Electronics Corporation: *See—*
Kato, Ryuzo, 3,714,488.
Wakai, Shuzo; and Nabae, Mitsuo, 3,714,598.

Matsuura, Takashi; and Chikano, Mitsuo, to Hoya Glass Works. Glass color filters for use under white and warm white fluorescent lights. 3,714,055, Cl. 252-300.000.

Matta, Richard K.: *See—*
Larkin, Melvyn W.; and Matta, Richard K., 3,713,911.

Mattel, Inc.: *See—*
Bear, David L.; and Plurkowsky, Stephen W., 3,713,252.
Kilroy, Eugene J., Jr., 3,713,246.

Matthew, John Campbell, to Mactaggart, Scott & Company, Limited. Aircraft arresting gear. 3,713,609, Cl. 244-110.00a.

Matthews, Raymond A., to Reynolds Metals Company. Apparatus for and method of forming a tubular metal blank into a tapered tube on a tapered mandrel. 3,713,319, Cl. 72-284.000.

Matzner, Markus: *See—*

Schober, Donald L.; McGrath, James E.; and Matzner,Markus, 3,714,289.
Matzuk, Alexander R.: *See—*
Ruyle, William V.; Sarett, Lewis H.; and Matzuk, Alexander R., 3,714,226.
Maurer, Albrecht: *See—*
Muller, Ernst; and Maurer, Albrecht, 3,713,470.
Maurizio, Gilberto: *See—*
Michellone, Giancarlo; Maurizio, Gilberto; Calcia, Giuseppe; Brandino, Dario; and Palazzetti, Mario, 3,713,708.
Maxey, Edwin M.: *See—*
Fabris, Hubert J.; Maxey, Edwin M.; and Uelzmann, Heinz, 3,714,127.
Mayer, Oscar, & Company, Inc.: *See—*
Grindrod, Paul E.; Goller, Robert L.; and Seiferth, Oscar E., 3,713,849.
Mazzeo, Michael P.; and Santaniello, Anthony F., to Thiokol Chemical Corporation. Polyurethanes based on a polyester prepared from azelaic acid, dimer acid and lower alkane glycols. 3,714,092, Cl. 260-22.0tn.
Mc Curry, Morris H., to TRW Inc. Brushless direct current motor including resonant circuits and differential amplifier for controlling commutation. 3,714,532, Cl. 318-254.000.
Mc Lean, Daniel C.: *See—*
Shaler, Amos J.; and Mc Lean, Daniel C., 3,713,542.
Mc Spadden, Hugh J.: *See—*
Marion, Frank A.; and Mc Spadden, Hugh J., 3,714,047.
McAfee, John G.; Mozley, James M.; and Stabler, Edward P. Tomographic radioisotopic imaging with a scintillation camera. 3,714,429, Cl. 250-61.500.
McCall, Samuel L.: *See—*
Hahn, Erwin L.; and McCall, Samuel L., 3,714,438.
McCann, David H.: *See—*
United States of America, National Aeronautics and Space Administration, 3,714,526.
McCarty, Kenneth P.: *See—*
Braak, Edmund C.; and McCarty, Kenneth P., 3,713,916.
McCleerey, Earl W.: *See—*
Cunningham, Tim; and McCleerey, Earl W., 3,713,227.
McClurkin, Cloise M. Air-flow oven. 3,713,401, Cl. 107-57.00b.
McCombs, Howard Lewis, Jr., to Bendix Corporation, The. Force balance lever mechanism. 3,713,366, Cl. 91-47.000.
McConnaughay, Kenneth E. Paving composition and method of making it. 3,713,856, Cl. 106-96.000.
McCoy, John J.; and Yoo, Jin Sun, to Atlantic Richfield Company. Process for the preparation of 2-pyrrolidone. 3,714,185, Cl. 260-326.5fn.
McCracken, Madelyn Iris; Randolph, Glenn Ray; and Watking, Dwight Wayland. Harness for restraining a child in a chair. 3,713,692, Cl. 297-385.000.
McCracken, Robert S., to Beagle Manufacturing Company. Mock stained-glass window structure. 3,713,958, Cl. 161-18.000.
McCrary, James H. Field emission X-ray tube. 3,714,486, Cl. 313-55.000.
McDonnell Douglas Corporation: *See—*
Strier, Murray P.; and Smatko, Joseph S., 3,713,890.
McDowell, Curtis S.; and Merrill, Claude, to United States of America, Air Force. Methylene dioxyamine. 3,714,199, Cl. 260-350.000.
McDowell, Curtis S.; and Merrill, Claude, to United States of America, Air Force. Acid salts of methylenedioxyamine. 3,714,200, Cl. 260-350.000.
McDowell, Donald J.; and Czernik, Daniel E., to Felt Products Mfg. Co. Road joint seal and end dam construction. 3,713,368, Cl. 94-18.000.
McGrath, James E.: *See—*
Schober, Donald L.; McGrath, James E.; and Matzner,Markus, 3,714,289.
McGrath, Robert Paul: *See—*
Lerner, Irwin; and McGrath, Robert Paul, 3,714,355.
McInerney, Frank Thomas: *See—*
Parker, John Henry; and McInerney, Frank Thomas, 3,713,397.
McInnis, Andrew M.; and Nielsen, Robert A. Combination anti-siphon and shut-off plastic valve. 3,713,457, Cl. 137-218.000.
McIntyre, Robert John; and Sprigings, Howard Charles, to RCA Limited. Quadrant photodiode. 3,714,491, Cl. 313-96.000.
McIver, Robert Faulds; and Marchbank, Frederick Albert Leslie, to United Kingdom Atomic Energy Authority. Removable covers for apertures in pressure vessels. 3,713,459, Cl. 137-357.000.
McKendry, Lennon H.: *See—*
Larsen, Eric R.; McKendry, Lennon H.; and Edamura, Fred Y., 3,714,233.
McKenzie, Joe A.: *See—*
Lindsey, Carl B.; and McKenzie, Joe A., 3,714,587.
McLarty, Shirley, to Cay Products, Inc. Fastener. 3,713,678, Cl. 287-189.360.
McMahan, J. Raymond: *See—*
Morris, Horton Harold; McMahan, J. Raymond; and Rogers, William I., 3,713,593.
McManus, James M., to Pfizer Inc. Process for lowering blood sugar levels. 3,714,364, Cl. 424-326.000.
McMaster, Harold A., to Guardian Industries Corporation. Apparatus for conveyoring glass sheets through adjacent bending and tempering stations. 3,713,799, Cl. 65-273.000.
McNair, Hugh Noel; and Olson, Stuart William. Fog nozzle. 3,713,589, Cl. 239-575.000.
McNeal, Hugh E. Bedclothes elevator and bed warmer. 3,713,182, Cl. 5-319.000.
McNereny, John J., to Selco Mining Corporation Limited, mesne. Method and apparatus for the detection of selected components in fluids. 3,714,562, Cl. 324-65.00r.
McQuistion, William E.: *See—*
Gilligan, William H.; and McQuistion, William E., 3,714,261.
McSwiggin, Joseph R.: *See—*
Lubsen, Timothy A.; Joffe, Frederick M.; Gregory, Paulee; and McSwiggin, Joseph R., 3,713,842.
Mears, Carleton M., Jr.; and Oberle, Paul W., to Hughes Aircraft Company. Despin control system for a multispin stabilize device. 3,714,434, Cl. 250-83.30h.
Medlar, Lewis A., to Honeywell Inc. Sensing apparatus for measuring the temperature of a heated rubber material during its curing process and method for making same. 3,713,339, Cl. 73-359.000.
Medovar, Boris Izrailevich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Baglai, Vitaly Mikhailovich; and Alferov, Jury Fedorovich, 3,713,476.
Meffert, Paul: *See—*
Pfleger, Hans; Bittner, Friedrich; and Meffert, Paul, 3,714,331.
Meitzenq Victor C., to Esso Production Research Company. Method of plugging back a well. 3,713,486, Cl. 166-250.000.
Meksula, Bernard. Portable container for fishing tackle and the like. 3,713,529, Cl. 206-16.00r.
Melamed, Sidney: *See—*
Minton, Robert G.; and Melamed, Sidney, 3,714,315.
Mellors, Geoffrey W.; and Senderoff, Seymour, to Union Carbide Corporation. Electrodeposition of zirconium diboride. 3,713,993, Cl. 204-3.000.
Menasco Manufacturing Company: *See—*
Kendall, Giles A., 3,713,641.
Mendelson, Morris. Navigable dam. 3,713,298, Cl. 61-30.000.
Meranda, James I., to Sperry Rand Corporation. Digital signal processor for use in a hyperbolic radio navigation receiver. 3,714,656, Cl. 343-103.000.
Mercadante, Joseph: *See—*
Gouirand, Rene, 3,713,665.
Merck & Co., Inc.: *See—*
Engelhardt, Edward L., 3,714,239.
Grenda, Victor J., 3,714,241.
Hoff, Dale R.; and Henry, David W., 3,714,158.
Ruyle, William V.; Sarett, Lewis H.; and Matzuk, Alexander R., 3,714,226.
Saari, Walfred S.; and Miller, Charles G., 3,714,229.
Sarett, Lewis H.; and Hannah, John, 3,714,232.
Windholz, Thomas B.; Johnston, David B. R.; and Patchett, Arthur A., 3,714,208.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Balsam, Gunter; and Kuener, Otto, 3,713,980.
Merianos, John J.: *See—*
Adams, Phillip; Petrocci, Alfonso N.; and Merianos, John J., 3,714,046.
Merrill, Claude: *See—*
McDowell, Curtis S.; and Merrill, Claude, 3,714,199.
McDowell, Curtis S.; and Merrill, Claude, 3,714,200.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See—*
Brunsch, Klaus, 3,713,753.
Messervey, Clifford H.: *See—*
Roberts, Victor I.; and Messervey, Clifford H., 3,713,326.
Metallgesellschaft Aktiengesellschaft: *See—*
Dorschner, Oskar; Storkebaum, Christoph; Carduck, Franz Josef; and Janfeld, Johannes, 3,713,590.
Metzger, Karl; and Scheuzger, Karl, to Ciba-Geigy AG. Polyglycidyl esters. 3,714,198, Cl. 260-348.00a.
Meyer, Albert; Wenger, Otto; and Maag, Oskar, to Maag Gear Wheel & Machine Company. Cold rolling profiles on cylindrical workpieces. 3,713,315, Cl. 72-100.000.
Michalko, Edward, to Universal Oil Products Company. Low density alumina spheres of improved strength at high temperature. 3,714,071, Cl. 252-448.000.
Michellone, Giancarlo; Palazzetti, Mario; and Tabasso, Giovanni, to Fiat Societa per Azioni. Antiskid braking method and apparatus. 3,713,705, Cl. 303-21.00p.
Michellone, Giancarlo; Maurizio, Gilberto; Calcia, Giuseppe; Brandino, Dario; and Palazzetti, Mario, to Fiat Societa per Azioni. Method and apparatus for the anti-skid braking of a vehicle wheel. 3,713,708, Cl. 303-21.00f.
Mickler, Brian E., to Schlumberger Technology Corporation. Memorizer. 3,714,623, Cl. 340-18.00.
Mickleson, James Peter. Animal control means. 3,713,580, Cl. 231-2.00e.
Microsystems International Limited: *See—*
Au, Kenneth K., 3,714,471.
Cowpland, Michael C. J.; and Dickinson, David J., 3,714,529.
Miczek, Charles B.: *See—*
Kennedy, William J. L.; Miczek, Charles B.; and Garabedian, George, 3,713,968.
Midland Optical Incorporated: *See—*
Gooch, Lester, 3,713,732.
Midland Silicones Limited: *See—*

Chandra, Grish; Owen, William John; Lloyd, Norman Cecil; and Cooper, Bryan Ewart, 3,714,118.
Midland-Ross Corporation: *See—*
Enk, Albert T.; and Franks, David B., 3,713,631.
Huffman, Herman M., 3,713,292.
Miles Laboratories, Inc.: *See—*
Clemens, Anton Hubert, 3,713,327.
Milesi, Domenico; and Natali, Remigo, to Colgate-Palmolive Company. Process for making enzyme-containing granules. 3,714,051, Cl. 252-135.000.
Miller, Carl J.; and Ryan, William P., to General Electric Company. Method of making cyclopolysiloxanes containing silanic hydrogen. 3,714,213, Cl. 260-448.20e.
Miller, Charles Eveleigh; and Schlatter, Gerald Lance, to International Telephone and Telegraph Corporation. Densitometer. 3,713,324, Cl. 73-1.00r.
Miller, Charles G.: *See—*
Saari, Walfred S.; and Miller, Charles G., 3,714,229.
Miller, Donald F.: *See—*
Enright, Dennis J.; Kahabka, Richard D.; and Miller, Donald F., 3,713,214.
Miller, Edward H.; and Chesmejef, Stephen, to General Electric Company. Combined moisture separator and reheater. 3,713,278, Cl. 55-269.000.
Miller, Franz Friedrich: *See—*
Erdmann, Hans; and Miller, Franz Friedrich, 3,714,211.
Miller, Harry C., to Sargent & Greenleaf, Inc. Key operable padlock with slidable seal for plug. 3,713,309, Cl. 70-38.00a.
Miller, James R.; Pierce, Richard H.; Linton, Robert W.; and Wills, John H., to Philadelphia Quartz Company. Silica. 3,714,068, Cl. 252-358.000.
Miller, Joseph G.: *See—*
Berstein, Theodore; and Miller, Joseph G., 3,713,336.
Miller, Ralph A. Body restraining device for vehicle. 3,713,694, Cl. 297-390.000.
Miller, Robert G.: *See—*
Coleman, Donald F.; and Miller, Robert G., 3,714,509.
Miller, Ruth A.: *See—*
Saari, Walfred S.; and Miller, Charles G., 3,714,229.
Miller, Warren Frederick: *See—*
Kime, Robert Clarence; and Miller, Warren Frederick, 3,714,593.
Millmaster Onyx Corporation: *See—*
Adams, Phillip; Petrocci, Alfonso N.; and Merianos, John J., 3,714,046.
Mills, Alfred Leonard; and Hartley, Kenneth, to United Kingdom Atomic Energy Authority. Processing of irradiated nuclear fuel. 3,714,058, Cl. 252-301.10r.
Mills, James B.: *See—*
Lawrence, Kenneth C.; and Mills, James B., 3,713,545.
Minigrip Inc., mesne: *See—*
Laguerre, Leon Ker, 3,713,923.
Ministry of International Trade and Industry: *See—*
Komiya, Yoshio; Moll, John L.; and Tarui, Yasuo, 3,714,522.
Minnesota Mining & Manufacturing Company: *See—*
Enright, Dennis J.; Kahabka, Richard D.; and Miller, Donald F., 3,713,214.
Minnesota Mining and Manufacturing Company: *See—*
Fayling, Richard E., 3,714,625.
Fayling, Richard E., 3,714,664.
Hampl, Edward F., Jr., 3,714,539.
Jonnes, Nelson, 3,714,115.
Minolta Camera Kabushiki Kaisha: *See—*
Suzuki, Hidenori; Iizaka, Isao; Horie, Yoshihiro; Maeda, Katsumi; and Inagaki, Shotaro, 3,713,737.
Uesugi, Kyozo, 3,713,725.
Minolta Camera Kabushiki Kaishi: *See—*
Sahara, Masayoshi; and Nanba, Yasuhiro, 3,714,543.
Minton, Robert; and Kamnitsis, Constantine, to United States of America, Navy, mesne. Variable direct current bias control circuit for linear operation of radio frequency power transistors. 3,714,601, Cl. 330-29.000.
Minton, Robert G.; and Melamed, Sidney, to Rohm & Haas Company. Method of producing shaped elastomer structure. 3,714,315, Cl. 264-210.00f.
Mishkovsky, Victor: *See—*
Kelley, Fred W., Jr.; Mishkovsky, Victor; and Singletary, William R., 3,714,544.
Mitchell, Robert S.: *See—*
King, Thomas M.; and Mitchell, Robert S., 3,714,067.
Mitsubishi Chemical Industries Limited: *See—*
Sato, shozo; Otaka, Yoshihisa; and Takigawa, Yukio, 3,714,343.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Arita, Yukio; and Ninomiya, Katsuya, 3,713,415.
Togiya, Akiyoshi; and Kakuda, Satoshi, 3,713,195.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Nakayama, Yujiro; Fukada, Tadayuki; and Ogawa, Masayuki, 3,714,083.
Nitta, Haruo; and Sagawa, Naotoshi, 3,714,312.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Kuniyasu, Yoshihiro; Matsumoto, Akio; Isobe, Eiji; and Someno, Kenji, 3,713,477.
Kuniyasu, Yoshiro; Matsumoto, Akio; Isobe, Eiji; and Honda, Hironobu, 3,713,787.
Mitsui Toatsu Chemicals, Inc.: *See—*
Fujiwara, Ryozo; Ohaha, Eiji; Maeda, Kazuo; Terada, Fumio; Sugino, Toshiyuki; Arakane, Hiroyasu; and Watanabe, Yoshimoto, 3,714,340.
Miura, Yuji: *See—*
Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshio; Kawanishi, Masazumi; Sato, Masanori; Hoshiyama, Masao; and Nagao, Taku, 3,714,171.
Miyazaki, Tetsuya: *See—*
Ueno, Ryuzr; and Miyazaki, Tetsuya, 3,714,227.
Mobil Oil Corporation: *See—*
Frangatos, Gerassimos, 3,714,045.
Gough, Stanley T. D., 3,714,169.
Gough, Stanley T. D., 3,714,350.
Lemanski, Chester G., 3,714,358.
Smith, Clarence G., 3,714,663.
Moccia, David E., to Procter & Gamble Company, The. Process for regulating plant growth. 3,713,804, Cl. 71-78.000.
Mochizuki, Yoshinari, to Hope Kabushiki Kaisha. Ski boot. 3,713,231, Cl. 36-2.5al.
Moe, Walter: *See—*
Cooper, Julius; and Moe, Walter, 3,713,656.
Moen, Forrest E. Attachment for silo unloaders. 3,713,551, Cl. 214-17.0cb.
Moergeli, Eduard, to Ciba-Geigy AG. Process for the manufacture of blue dispersion dyestuffs. 3,714,205, Cl. 260-380.000.
Moffett, S. Neil: *See—*
Bernath, Kornel; Moffett, S. Neil; and Papafingos, Pandelis N., 3,713,904.
Mohler, David Brian, to Ledex, Inc. Electromechanical stepping mechanism for positioning load devices. 3,714,518, Cl. 317-139.000.
Mohr, Reinhard: *See—*
Mundlos, Eberhard; Mohr, Reinhard; and Lohe, Konrad, 3,713,770.
Moir, Ralph W.: *See—*
Hamilton, Gordon W.; Moir, Ralph W.; Osher, John E.; and Post, Richard F., 3,713,967.
Moll, John L.: *See—*
Komiya, Yoshio; Moll, John L.; and Tarui, Yasuo, 3,714,522.
Moller, Klaus; Munch, Dietrich; and Wolert, Hartmut, to Dravo Corporation. Device for sealing travelling grates. 3,713,634, Cl. 266-21.000.
Molyneux, Walter Guillam, to National Research Development Corporation. Method of making fibre reinforced composites. 3,713,946, Cl. 156-293.000.
Monroe, James G., to Hyster Company. Multiple position overhead guard. 3,713,688, Cl. 296-107.000.
Monsanto Company: *See—*
Bergomi, Joseph G., Jr., 3,714,104.
Bergomi, Joseph G., Jr., 3,714,298.
Chupp, John P., 3,714,162.
Clark, Frank S., 3,714,043.
Dixon, William D., 3,714,247.
Downs, Ronald O.; Engelbrecht, Robert M.; Hill, James C.; and Moore, Richard N., 3,714,282.
Engelbrecht, Robert M.; Hill, James C.; and Moore, Richard N., 3,714,003.
Goldberg, Jack, 3,714,470.
Huff, Richard R., 3,713,943.
King, Thomas M.; and Vandersall, L., 3,714,066.
King, Thomas M.; and Mitchell, Robert S., 3,714,067.
Olin, John F., 3,714,299.
Smith, Lowell R., 3,714,303.
Tung, Ching C.; and Powers, Jack F., 3,714,209.
Monson, Donald R.: *See—*
Keller, Darryl E.; and Monson, Donald R., 3,713,280.
Montacie, Marcel, to Union Industrielle Blanzyouest. Universal continuous boring machine. 3,713,700, Cl. 299-31.000.
Moore, Lester P. Gas-liquid separator. 3,713,279, Cl. 55-319.000.
Moore, Richard N.: *See—*
Downs, Ronald O.; Engelbrecht, Robert M.; Hill, James C.; and Moore, Richard N., 3,714,282.
Engelbrecht, Robert M.; Hill, James C.; and Moore, Richard N., 3,714,003.
Moore, Wesley D.; and Baker, Silveus M., to Royal Industries, Inc. Control rod drive mechanism. 3,714,479, Cl. 310-80.000.
Moran, John J., to Hycel, Inc. Fume exhaust and treating system. 3,713,785, Cl. 23-292.000.
Moran, Paul J., to General Electric Company. Method of charging secondary metal-air cell. 3,713,892, Cl. 136-86.00a.
Morante, Robert J., to Bausch & Lomb Incorporation. Inverted telephoto lenses having elements in edge contact. 3,713,724, Cl. 359-216.000.
Moreau, Charles: *See—*
Ducrocq, Roger; and Moreau, Charles, 3,713,410.
Moretti, Alfred J., to Xerox Corporation. Store and forward speed changer for off-line transmission of binary data. 3,714,377, Cl. 179-15.55r.
Morey, Roger John: *See—*
Hodgkinson, Joseph B.; and Morey, Roger John, 3,713,650.
Morgan, Charles R.: *See—*
Godfrey, John J.; and Morgan, Charles R., 3,714,223.
Morgan, Robert A.; and Rishel, Paul A., to Maschinenfabrik Gehring KG. Universal transducer mounting bracket and assembly. 3,714,619, Cl. 340-8.00s.

Morgan, Vernon: *See—*
Coast, Geoffrey; Prince, Kenneth; Spruce, Brian; and Morgan, Vernon, 3,713,972.
Morgan, William R., Jr. Flooring system. 3,713,264, Cl. 52-489.000.
Mori, Ernest A.: *See—*
Arscott, Raymond L.; Gaylord, Eber W.; Mori, Ernest A.; and Morris, Richard A., 3,713,499.
Mori, Takakazu: *See—*
Arai, Hiroshi; and Mori, Takakazu, 3,714,458.
Morimoto, Kazuo; and Naito, Etsuo, to Eisai Kabushiki Kaisha. Certain hydroxamic acids as growth promoting agents. 3,714,361, Cl. 424-320.000.
Morishita, Masataka: *See—*
Kitajima, Masao; Kondo, Asaji; and Morishita, Masataka, 3,714,065.
Moritake, Koiti, to Kabushiki Kaisha Takenishi Seisakusho. Roller provided with speed controlling mechanism for articles being conveyed on a roller conveyor. 3,713,521, Cl. 193-37.000.
Morris, Horton Harold; McMahan, J. Raymond; and Rogers, William I., to Freeport Sulphur Company. Fine media milling process. 3,713,593, Cl. 241-27.000.
Morris, Richard A.: *See—*
Arscott, Raymond L.; Gaylord, Eber W.; Mori, Ernest A.; and Morris, Richard A., 3,713,499.
Morse, Hugh B.: *See—*
Schafer, George; and Morse, Hugh B., 3,713,952.
Mort, Robert E.; and Creaser, George E., to Inter-Lock Steel Company, Inc. Roof truss machine. 3,713,381, Cl. 100-100.000.
Morton, Henry C., to Bendix Corporation, The. Method of producing friction facings. 3,713,934, Cl. 156-180.000.
Morton-Norwich Products, Inc.: *See—*
Burrous, Stanley E.; Eudy, William W.; and Siedler, Arthur J., 3,714,356.
Mosca, Gianni: *See—*
Gubernick, Joseph; Krause, Robert J.; Lerner, Amos; and Mosca, Gianni, 3,714,346.
Motorola, Inc.: *See—*
Cecil, James Barton, 3,714,599.
de Laune, Jon M., 3,714,463.
Friend, Lawrence O., 3,714,606.
Lace, Melvin A., 3,714,482.
Reynolds, Gary R., 3,714,597.
Mottez, Paul; and Lejeune, Regis, to Societe Chimique des Charbonnages. Plasticisers for vinyl polymers and processes for their production. 3,714,053, Cl. 252-182.000.
Mouldings, Inc.: *See—*
Rash, James T., 3,713,421.
Mozley, James M.: *See—*
McAfee, John G.; Mozley, James M.; and Stabler, Edward P., 3,714,429.
Muckter, Heinrich: *See—*
Huemer, Heinrich; Herrling, Siegfried; and Muckter, Heinrich, 3,714,206.
Mueller, Herbert; Koernig, Wolfgang; and Koehl, Harald, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of isoprene. 3,714,285, Cl. 260-681.000.
Muhlhausler, Wolfgang, to Fouguet-Werk Frauz & Planck. Thread supply device for textile machinery. 3,713,307, Cl. 66-132.000.
Mukai, Tsu: *See—*
Inoue, Touru; Noguchi, Seizo; and Mukai, Tsu, 3,713,729.
Mulfinger, Hans-Otto: *See—*
Geffcken, Walter; Paquet, Volker; Dislich, Helmut; Dutz, Hubert; and Mulfinger, Hans-Otto, 3,713,869.
Mulier, Pieter M. J. Cardiac pacer with externally controllable variable width output pulse. 3,713,449, Cl. 128-419.00p.
Mullen, William T. Expansion joints for roofs. 3,713,263, Cl. 52-403.000.
Mullens, George O. Rubbish disposal device. 3,713,581, Cl. 232-1.00e.
Muller, Ernst; and Maurer, Albrecht, to Bizerba-Werke Wilhelm Kraut KG. Slicing machine with material advancing clamping means. 3,713,470, Cl. 83-718.000.
Muller, Siegfried A.: *See—*
Schweiger, Richard G.; and Muller, Siegfried A., 3,714,210.
Muller, Wolfram, to Bosch, Robert, GmbH. Automatically steered self-propelled vehicle. 3,713,505, Cl. 180-79.100.
Munch, Dietrich: *See—*
Moller, Klaus; Munch, Dietrich; and Wolert, Hartmut, 3,713,634.
Mundlos, Eberhard; Mohr, Reinhard; and Lohe, Konrad, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the dyeing or printing of textile materials made from polymers or copolymers of acrylonitrile. 3,713,770, Cl. 8-177.0b.
Munger, Donald W., to Automation Industries, Inc. Ultrasonic echo encephalograph for measuring the position of the midline. 3,713,329, Cl. 73-67.900.
Murphy Chemical Company Limited, The: *See—*
Pianka, Max, 3,714,230.
Murray, James E.; and Kirsch, Robert P., to Harris-Intertype Corporation. Apparatus for use with a web FED mechanism. 3,713,600, Cl. 242-58.400.
Mussinan, Cynthia J.: *See—*
Elberon, Ira Katz; Wilson, Richard A.; and Mussinan, Cynthia J., 3,713,848.
Muth, Victor O.: *See—*
Dillman, Ned E.; Gillund, Arden G.; Muth, Victor O.; and Recupito, Pasquale, 3,714,627.
Mutschler, Edward C.; and Klavsons, Uldis, to Xerox Corporation. Electrostatic recording with improved electrostatic charge retention. 3,714,665, Cl. 346-74.0es.
Nabae, Mitsuo: *See—*
Wakai, Shuzo; and Nabae, Mitsuo, 3,714,598.
Nagao, Taku: *See—*
Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshio; Kawanishi, Masazumi; Sato, Masanori; Hoshiyama, Masao; and Nagao, Taku, 3,714,171.
Nagarekawa, Osamu: *See—*
Izumitani, Tetsuro; Asahara, Yoshiyuki; Tsuchiyz, Makoto; and Nagarekawa, Osamu, 3,714,073.
Nagayama, Masuzo; and Okada, Hiroshi, to Lion Fat & Oil Co., Ltd. Method of sulfonating an olefin mixture. 3,714,238, Cl. 260-513.00r.
Nagelsmann, Hermann: *See—*
Beyer, Gerhard; and Nagelsmann, Hermann, 3,713,875.
Naito, Etsuo: *See—*
Morimoto, Kazuo; and Naito, Etsuo, 3,714,361.
Naito, Takeo: *See—*
Dohmori, Renzo; Kadoya, Shizuo; Takamura, Isao; Oshima, Yasuo; and Naito, Takeo, 3,714,170.
Nakaguchi, Glenn M.; Wang, Ting-I.; and Caserio, Frederick F., Jr., to Atlantic Richfield Company. Vinyl glycerol acetals. 3,714,202, Cl. 260-340.700.
Nakajima, Yosuke: *See—*
Nishio, Fumihiko; Nishio, Daijiro; Watarai, Syu; Ohkubo, Kinji; and Nakajima, Yosuke, 3,713,829.
Nakamura, Noboru. High-pressure mercury vapor halide lamp having a refractory metal cylindrical auxiliary electrode. 3,714,494, Cl. 313-198.000.
Nakamura, Ryoji, to Japan Storage Battery Co., Ltd. Water circulating type battery used in torpedo or the like. 3,713,413, Cl. 114-20.00r.
Nakanishi, Osamu; and Tanaka, Ikuo, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Unitary liquid polysulfide polymer composition. 3,714,132, Cl. 260-79.000.
Nakayama, Kiyoshi; and Araki, Kazumi, to Kyowa Hakko Kogyo Co., Ltd. Process for producing L-histidine. 3,713,977, Cl. 195-29.000.
Nakayama, Shozo, to Kabushiki Kaisha Toyoda Jidoshoki Seisakusho. Refrigeration compressor for vehicles. 3,713,758, Cl. 417-312.000.
Nakayama, Yasuharu, to Kansai Paint Company Limited. Process for preparing graft-copolymers. 3,714,295, Cl. 260-879.000.
Nakayama, Yujiro; Fukada, Tadayuki; and Ogawa, Masayuki, to Mitsubishi Petrochemical Co., Ltd. Method for producing foamed article from polypropylene. 3,714,083, Cl. 260-2.5ha.
Nalco Chemical Company: *See—*
Vossos, Peter H., 3,714,064.
Nalco-Chemical Company: *See—*
Roelofs, Henry M.; and Lafferty, William J., 3,713,475.
Nanba, Yasuhiro: *See—*
Sahara, Masayoshi; and Nanba, Yasuhiro, 3,714,543.
Naoi, Fusaji: *See—*
Shigezane, Suzu; Naoi, Fusaji; Saito, Seiichi; Kojima, Michio; and Ishida, Ryuichi, 3,714,175.
Narayanan, Venkatachala Lakeshmi: *See—*
Haugwitz, Rudiger D.; and Narayanan, Venkatachala Lakeshmi, 3,714,180.
Narita, Hiroshi: *See—*
Kariya, Shizuo; Narita, Hiroshi; Tuboi, Takashi; and Takahashi, Tetsuya, 3,714,467.
Nash Engineering Company: *See—*
Fitch, James B., 3,713,749.
Natali, Remigo: *See—*
Milesi, Domenico; and Natali, Remigo, 3,714,051.
National Cash Register Company, The: *See—*
Lin, Chao-Han; and Wright, Arthur J., 3,713,863.
National Research Development Corporation: *See—*
Farr, John P. G.; and Harris, Ivor Rex, 3,713,270.
Molyneux, Walter Guillam, 3,713,946.
Naumann, Eugene C.; and Hagood, Gideon J., Jr., to United States of America, National Aeronautics and Space Administration. Function generator for syntesizing complex vibration mode patterns. 3,714,405, Cl. 235-197.000.
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, to Institut Elektrosvarki Imeni E. O. Patona Akademii Nauk UkrainskoiSSR. Current feeder to a moving current-carrying surface. 3,714,368, Cl. 13-16.000.
Nautron Corporation: *See—*
Tufts, Wesley M.; and Albertassi, James H., 3,713,177.
Navratil, Peter: *See—*
Feist, Wieland; Navratil, Peter; and Seifert, Roman, 3,713,612.
NDM Corporation, mesne: *See—*
Szpur, Roman, 3,713,435.
Nead, Thomas E.: *See—*
Albrecht, George O.; and Nead, Thomas E., 3,714,538.
Neary, Ralph E., to Schlage Lock Company. Thumb turn lock mechanism. 3,713,683, Cl. 292-336.300.
Necchi S.p.A.: *See—*
Bianchi, Nereo, 3,713,405.
Nedelec, Lucien; and Torelli, Vesperto, to Roussel-UCLAF. 1-Oxa-a-nor steroids. 3,714,203, Cl. 260-343.300.
Neises, Helmut: *See—*
Schaefer, Horst; and Neises, Helmut, 3,714,086.

Nelson, George L., to Bird Machine Company. Screening machine with slotted screen. 3,713,541, Cl. 210-415.000.

Nelson, Melvin O., to Phillips Petroleum Company. Apparatus for removing the flashed waste from a blow molded object. 3,713,764, Cl. 425-30.00r.

Nettesheim, Raphael D., to Schwaab Label Company, Inc. Method of making a printing sleeve having printing characters around its periphery. 3,714,308, Cl. 264-45.000.

Neuhaus, Herbert M.: *See—*
Johnson, Clifford T.; Neuhaus, Herbert M.; Silver, Wallace E.; Whiting, Gordon D.; and Larson, Richard A. N., 3,713,361.

New Jersey Zinc Company, The: *See—*
Umstead, Charles H., 3,713,786.

Newkirk, Terry F.: *See—*
Whitney, David J.; and Newkirk, Terry F., 3,714,609.

Nicholes, Paul S. Filtration system. 3,713,440, Cl. 128-188.000.

Nichols, Frank S.: *See—*
Charewicz, Francis J.; Steele, Eugene K.; and Nichols, Frank S., 3,714,318.

Nicklin, Thomas; and Farrington, Frederick, to Gas Council, The. Treatment of gases and liquids. 3,714,328, Cl. 423-244.000.

Niedrach, Leonard W., to General Electric Company. Sensor with ion exchange resin electrolyte. 3,714,015, Cl. 204-195.00p.

Nielsen, Robert A.: *See—*
McInnis, Andrew M.; and Nielsen, Robert A., 3,713,457.

Niemann, Fred T. Fence guard. 3,713,624, Cl. 256-32.000.

Niemegeers, Carlos Jan Ernest Josef: *See—*
Janssen, Paul Adriaan Jan; Niemegeers, Carlos Jan Ernest Josef; Stokbroekx, Raymond Antoine; and Vandenberk, Jan, 3,714,159.

Niemietz, Jurgen P., to Triumph Werke Nuernberg A.G. Typing rate control for type bar typewriters. 3,713,523, Cl. 197-19.000.

Nigro, Louis V., to Gillette Company, The. Pressurized dispensing package system. 3,713,464, Cl. 141-20.000.

Nilsson, Nils Edvin Folke; and Eurenius, Jimmie Arne, to Stal Refrigeration AB. Means for breaking down aqueous jelly-like solutions and thus separating water and solid constituents from each other by means of freezing and subsequent melting. 3,713,303, C. 62-123.000.

Ninomiya, Katsuya: *See—*
Arita, Yukio; and Ninomiya, Katsuya, 3,713,415.

Nippon Chemical Industrial Co., Ltd.: *See—*
Fukuda, Yasuhiko; and Yuyuma, Noboru, 3,714,366.

Nippon Electric Company, Limited: *See—*
Takamori, Takeshi; and Akanuma, Masanobu, 3,713,790.

Nippon Glass Fiber Co., Ltd.: *See—*
Inoue, Touru; Noguchi, Seizo; and Mukai, Tsu, 3,713,729.

Nippon Kogaku K.K.: *See—*
Fujii, Tatsuo, 3,713,369.
Katsuyama, Yoshihisa, 3,714,524.
Sato, Akihiko, 3,713,373.

Nippon Oil Company, Limited: *See—*
Imai, Hirosuke; and Koizumi, Takeo, 3,714,279.

Nippon Sheet Glass Co., Ltd.: *See—*
Inoue, Touru; Noguchi, Seizo; and Mukai, Tsu, 3,713,729.

Nippon Telegraph and Telephone Public Corporation: *See—*
Kimura, Yutaka; Ariizumi, Yoshio; Masuda, Yutaka; Yamagami, Teruhiro; and Okita, Yasushi, 3,714,378.

Nippon Telegrpah Public Corporation: *See—*
Matsuda, Ryoichi; and Terai, Masaaki, 3,714,381.

Nippondenso Kabushiki Kaisha: *See—*
Torii, Tanekatsu, 3,714,389.

Nippondenso Kabushiki Kaishi: *See—*
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, 3,713,355.

Nishimura, Takehiko: *See—*
Kitagawa, Chojiro; Fukuoka, Ichiro; Kadawaki, Takashi; Kimura, Shoji; Nishimura, Takehiko; and Hanabusa, Kanehisa, 3,714,296.

Nishio, Daijiro: *See—*
Nishio, Fumihiko; Nishio, Daijiro; Watarai, Syu; Ohkubo, Kinji; and Nakajima, Yosuke, 3,713,829.

Nishio, Fumihiko; Nishio, Daijiro; Watarai, Syu; Ohkubo, Kinji; and Nakajima, Yosuke, to Fuji Photo Film Co., Ltd. Photographic light sensitive material containing copolymer layer. 3,713,829, Cl. 96-85.000.

Nitta, Haruo; and Sagawa, Naotoshi, to Mitsubishi Petrochemical Co., Ltd. Method of producing reinforced pipe. 3,714,312, Cl. 264-108.000.

Nitto Boseki Co., Ltd.: *See—*
Sasakura, Tadao, 3,713,964.

Nitton Company, Limited: *See—*
Kobayashi, Akihiro, 3,714,433.

Nixen, David; and Lee, Chune, to North American Rockwell Corporation. Plastic package assembly for electronic circuit and process for producing the package. 3,714,370, Cl. 174-52.00s.

NL Industries, Inc.: *See—*
Katell, Abraham, 3,713,975.

Noguchi, Seizo: *See—*
Inoue, Touru; Noguchi, Seizo; and Mukai, Tsu, 3,713,729.

Nomura, Harehiko; and Shimamoto, Susumu, to Industrial Science & Technology, Agency of. Aluminum clad multiplex superconductor. 3,714,371, Cl. 174-126.0cp.

Norbalt Rubber Corporation: *See—*
Stefanka, Joseph Anthony, 3,714,311.

Nordstrom, John D., to Ford Motor Company. Vinyl resin-siloxane paint. 3,714,288, Cl. 260-827.000.

Norman, Arthur J.: *See—*
Cobbledick, David S.; and Norman, Arthur J., 3,714,077.

Normand, Georges; and Venobre, Henri, to Commissariat a l'Energie Atomique. Nuclear fuel assembly. 3,713,973, Cl. 176-78.000.

Norris, Steven R.: *See—*
Dare, Sherman E.; Haas, Davey S.; Herold, Stanley J.; Norris, Steven R.; Patterson, Terry V.; and Sloan, Robert E., 3,713,394.

North American Rockwell Corporation: *See—*
Kuhn, Richard B., 3,714,373.
Nixen, David; and Lee, Chune, 3,714,370.
Rosevear, Allan F.; and Acampora, Ferdinando M., 3,713,909.
Spence, John R., 3,714,466.

Northan, Barbara J.; and Boies, David B., to United States of America, Navy. Corrosion preventing composition. 3,714,069, Cl. 252-389.00a.

Northeastern Pennsylvania Research and Development Co., Inc.: *See—*
Delaney, John J.; and Gervais, Henry O., 3,713,502.

Norton, Richard V., to Sun Oil Company. Hydroxyalkylaminoalkylamides and their preparation. 3,714,249, Cl. 260-558.00r.

Norwood Industries, Inc.: *See—*
Sutton, Robert G., 3,713,938.

Notaro, Vincent A.; and Selwitz, Charles M., to Gulf Research & Development Company. Process for preparing chlorinated aromatics. 3,714,277, Cl. 260-650.00r.

Notelteirs, Victor Rosallie, to U.S. Philips Corporation. Seal rotary distribution valve. 3,713,461, Cl. 137-625.180.

Nurnberg, Richard K.; and Koch, Erich O., to Robertshaw Controls Company. Multiple point alarm system with two state alarm switches. 3,714,646, Cl. 340-412.000.

Nurnberg, Werner; and Hanitsch, Rolf, to Licentia Patent-Verwaltungs G.m.b.H. Shield for electrical machines. 3,714,483, Cl. 310-256.000.

Nutt, Ronald, to Ortec, Incorporated. Detecting circuit for indicating occurrence of peak in an input signal. 3,714,464, Cl. 307-235.000.

N.V. Rubberfabriek Vredestein: *See—*
Bohmann, Otto Alwin Ludwig, 3,713,232.

O. K. Tool Company, Inc., The: *See—*
Williams, Thurston V.; and Cheever, Leo H., 3,713,254.

Oakes, Grant A. Slipper bearing. 3,713,791, Cl. 29-196.300.

Oberle, Paul W.: *See—*
Mears, Carleton M., Jr.; and Oberle, Paul W., 3,714,434.

O'Connor, Donald J.; and Fast, Clarence R., to Amoco Production Company. Igniter mechanism for solid propellants under high fluid head. 3,713,393, Cl. 102-70.000.

O'Connor, Leo Thomas, Jr.: *See—*
Hamilton, John Arthur; Hughes, David Robert; and O'Connor, Leo Thomas, Jr., 3,714,635.

Odada, Takashi: *See—*
Yoshida, Shoushi; Iwama, Atsuaki; Odada, Takashi; and Suda, Tetsuo, 3,714,321.

O'Dell, Rawleigh D., 1/2 to O'Dell, Ulace J. Ladder push-out apparatus. 3,713,510, Cl. 182-20.000.

O'Dell, Ulace J.: *See—*
O'Dell, Rawleigh D., 3,713,510.

Odessky Zavod Pressov: *See—*
Tobak, Lev Zeilikovich; Shterman, Semen Abramovich; Brandenburgsky, Mikhail Galileevich; Lichman, Nikolai Iosifovich; and Lugovskoi, Andrei Lukyanovich, 3,713,198.

O'Donnell, Thomas P.: *See—*
Austin, Lewis M.; Denman, Robert R.; O'Donnell, Thomas P.; and Veres, Frank, 3,713,728.

Office National d'Etudes et de Recherches Aerospaticles Chatillon-Sous-Bagneux: *See—*
Galmiche, Philippe M.; Pelissier, Jean H.; and Spinat, Roland R., 3,713,206.

Ogawa, Francis T., to Honeywell Inc. Remotely controlled light sensing apparatus. 3,714,443, Cl. 250-214.00p.

Ogawa, Masayuki: *See—*
Nakayama, Yujiro; Fukada, Tadayuki; and Ogawa, Masayuki, 3,714,083.

Ogawa, Yoji: *See—*
Tamura, Masanori; Fukuda, Muneyuki; and Ogawa, Yoji, 3,713,647.

Ogren, John R.: *See—*
Blumenthal, Jack L.; Ogren, John R.; and Appel, Marvin, 3,713,901.

Ohaha, Eiji: *See—*
Fujiwara, Ryozo; Ohaha, Eiji; Maeda, Kazuo; Terada, Fumio; Sugino, Toshiyuki; Arakane, Hiroyasu; and Watanabe, Yoshimoto, 3,714,340.

Ohkubo, Kinji: *See—*
Nishio, Fumihiko; Nishio, Daijiro; Watarai, Syu; Ohkubo, Kinji; and Nakajima, Yosuke, 3,713,829.

Ohrui, Tetsuya; Sakakibara, Yasuhito; and Tanaka, Junji, to Sumitomo Chemical Company Limited. Method for producing concentrated nitric acid. 3,714,333, Cl. 423-392.000.

Oie, Kunihisa: *See—*
Ito, Ken; Kaminaka, Hiroshi; and Oie, Kunihisa, 3,714,269.

Oka, Isao: *See—*
Shima, Takeo; Urasaki, Takanori; and Oka, Isao, 3,714,125.

Okada, Hiroshi: *See—*
Nagayama, Masuzo; and Okada, Hiroshi, 3,714,238.

Okada, Yoshihiko; and Matsubara, Takashi, to Toagosei Chemical Industry Co., Ltd. Method for purifying 1,12-dodecanedioic acid. 3,714,244, Cl. 260-537.00p.

Okamoto, Tadashi; Kobayashi, Tsuyoshi; and Yamamoto, Hisao, to Sumitomo Chemical Co., Ltd. Process for preparing dibenzazocine derivatives and salts thereof. 3,714,148, Cl. 260-239.00d.

Okano, Hiroshi: *See—*
Hosoki, Shigeyuki; Okano, Hiroshi; and Kamijo, Kazuaki, 3,714,422.

Okano, Takeshi, to Fuji Shashin Film Kabushiki Kaisha. Sheet film curl correcting device. 3,713,644, Cl. 271-8.000.

Oki Electric Industry Co., Ltd.: *See—*
Kimura, Yutaka; Ariizumi, Yoshio; Masuda, Yutaka; Yamagami, Teruhiro; and Okita, Yasushi, 3,714,378.

Okita, Yasushi: *See—*
Kimura, Yutaka; Ariizumi, Yoshio; Masuda, Yutaka; Yamagami, Teruhiro; and Okita, Yasushi, 3,714,378.

Okuda, Kensuke: *See—*
Takahashi, Masaaki; Yamauchi, Takashi; Okuda, Kensuke; and Ito, Akira, 3,714,021.

Olechowski, Jerome Robert, to Cities Service Company. Molecular sizing process. 3,714,134, Cl. 260-85.30r.

Olechowski, Jerome Robert, to Cities Service Company. Addition products of nitrosyl halides and cyclic unsaturated hydrocarbons. 3,714,255, Cl. 260-566.00a.

Olin Corporation: *See—*
Andrew, Eugene A., 3,713,359.
Capuano, Italo A., 3,713,776.
Finley, Carl E., 3,713,432.
Shansey, John W., 3,713,360.

Olin, John F., to Monsanto Company. Phosphorylated anilides. 3,714,299, Cl. 260-926.000.

Olin Mathieson Chemical Corporation: *See—*
Coffee, Ralph E., 3,714,306.
Schnabel, Wilhelm J.; Kober, Ehrenfried H.; and Kraus, Theodore C., 3,714,216.

Oliver, Joseph J.: *See—*
Fuller, Roger L.; Gustafsson, Sven G.; Harris, Derek V.; Kaye, Robert K.; and Oliver, Joseph J., 3,714,650.

Oliver, Roy N.; and Spain, Roy C. Detachably fixed cylinder lock core. 3,713,311, Cl. 70-369.000.

Olsen, Leslie E. Service light for dining tables. 3,714,410, Cl. 240-6.40r.

Olsen, Robert E., to United States of America, Army. Preparing alpha-bromomethyl ketones via substituted diethyl malonates. 3,714,168, Cl. 260-281.00r.

Olson, Stuart William: *See—*
McNair, Hugh Noel; and Olson, Stuart William, 3,713,589.

OMEGA Brandt, Louis, & Frere S.A.: *See—*
Vogt, Kurt; and Maillard, Poland, 3,713,287.

Omohundro, William A.: *See—*
Chen, Nai-Keung; and Omohundro, William A., 3,713,455.

Onishi, Hajime: *See—*
Takeyama, Kojiro; and Onishi, Hajime, 3,713,226.

Onoda, Yoshimitsu: *See—*
Kuwabara, Takeo; Kiwaki, Hisakatsu; Sato, Hiroshi; and Onoda, Yoshimitsu, 3,714,541.

Orlando, Charles M.: *See—*
Relles, Howard M.; Orlando, Charles M.; and Schluenz, Robert W., 3,714,278.

Orlando, James V. Portable wall partition. 3,713,474, Cl. 160-351.000.

Orris, Edward C., to Ion Equipment Corporation. Cathode sputtering electrode assembly. 3,714,019, Cl. 204-298.000.

Ortec, Incorporated: *See—*
Nutt, Ronald, 3,714,464.

Osada,Koichi: *See—*
Baba, Takesi; Osada,Koichi; Hokawa, Takuya; and Suzuki, Fumio, 3,714,574.

Osborne, William B.: *See—*
Gribowski, George J.; Osborne, William B.; and Wilson, Rexford, 3,713,491.

Osher, John E.: *See—*
Hamilton, Gordon W.; Moir, Ralph W.; Osher, John E.; and Post, Richard F., 3,713,967.

Oshima, Yasuo: *See—*
Dohmori, Renzo; Kadoya, Shizuo; Takamura, Isao; Oshima, Yasuo; and Naito, Takeo, 3,714,170.

Otaka, Yoshihisa: *See—*
Sato, shozo; Otaka, Yoshihisa; and Takigawa, Yukio, 3,714,343.

Otsugu, Shozo, to Kasei, C. I., Co., Ltd. Apparatus for the extrusion molding of foamable plastics. 3,713,762, Cl. 425-197.000.

Otto, Klaus: *See—*
Stark, Gustav; Otto, Klaus; and Geissler, Rolf, 3,714,017.

Outboard Marine Corporation: *See—*
Eichner, Don W., 3,713,937.

Ouwerkerk, Jacobus S. M.: *See—*
Van Der Toorn, Lambertus J.; Ouwerkerk, Jacobus S. M.; and Van Klinken, Jakob, 3,714,031.

Owen, Brian: *See—*
Barnes, Clare Earl; and Owen, Brian, 3,714,608.

Owen, Dave L.: *See—*
Bowden, Woodrow R., Jr.; Owen, Dave L.; Calvert, Orville M.; and Holcombe, Edward L., 3,713,267.

Owen, William John: *See—*
Chandra, Grish; Owen, William John; Lloyd, Norman Cecil; and Cooper, Bryan Ewart, 3,714,118.

Owens-Corning Fiberglas Corporation: *See—*
Marzocchi, Alfred, 3,713,871.

Owens-Illinois, Inc.: *See—*
Austin, Lewis M.; Denman, Robert R.; O'Donnell, Thomas P.; and Veres, Frank, 3,713,728.

Oxy Metal Finishing Corporation: *See—*
Symons, Philip C., 3,713,888.

Oxy Metal Finishing Corporation, mesne: *See—*
Galloway, James H., 3,714,540.

Pacciarini, Antonio: *See—*
Bottasso, Franco; Pacciarini, Antonio; and Caretta, Renato, 3,713,929.

Pacific Game Company: *See—*
Kayle, Jerry P., 3,714,612.

Padgett, George L.: *See—*
Carlstrom, Lawrence A.; and Padgett, George L., 3,713,676.

Padgett, William J.: *See—*
Denenberg, Jeffrey N.; and Padgett, William J., 3,714,595.

Pagano, Samuel J. Knot-typing device for barrel knots. 3,713,680, Cl. 289-17.000.

Paik, William W.: *See—*
United States of America, National Aeronautics and Space Administration, 3,713,987.

Pajak, Zdzislaw; Jurga, Kazimierz; and Jurga, Jan, to Uniwersytel im. Adama Mickiewicza w Pozaniu. Method for measuring the distribution of magnetic nuclear relaxation times. 3,714,551, Cl. 324-.50r.

Palazzetti, Mario: *See—*
Michellone, Giancarlo; Palazzetti, Mario; and Tabasso, Giovanni, 3,713,705.
Michellone, Giancarlo; Maurizio, Gilberto; Calcia, Giuseppe; Brandino, Dario; and Palazzetti, Mario, 3,713,708.

Papafingos, Pandelis N.: *See—*
Bernath, Kornel; Moffett, S. Neil; and Papafingos, Pandelis N., 3,713,904.

Paquet, Volker: *See—*
Geffcken, Walter; Paquet, Volker; Dislich, Helmut; Dutz, Hubert; and Mulfinger, Hans-Otto, 3,713,869.

Paris, August F. Pants pressing apparatus. 3,713,567, Cl. 223-73.000.

Parker, John Henry; and McInerney, Frank Thomas, to M L W-Worthington, Limited. Motorized railway truck. 3,713,397, Cl. 105-136.000.

Parker Manufacturing Company: *See—*
Lapointe, Gabriel M., 3,713,321.

Parker, Roger Alan, to Richardson-Merrell Inc. Dilxathiocin carboxylic acids, esters, salts and amides. 3,714,191, Cl. 260-327.00b.

Parkinson, Dean B.; and Brown, Arthur G., to Glass Containers Corporation. Method of coating glass containers and the like. 3,713,867, Cl. 117-54.000.

Parrilla, Salvatore C. Bottle top attachment and toy. 3,713,247, Cl. 46-17.000.

Parsons, Kenneth C., to United States of America, Navy. Explosive lead plug. 3,713,392, Cl. 102-70.000.

Patchett, Arthur A.: *See—*
Windholz, Thomas B.; Johnston, David B. R.; and Patchett, Arthur A., 3,714,208.

Patel, Arvind M.: *See—*
Hong, Se J.; and Patel, Arvind M., 3,714,629.

Paterson, Stephen, to Cutting Room Appliances Corporation. Manually controlled cloth laying machine carriage. 3,713,642, Cl. 270-31.000.

Patil, Arvind S.: *See—*
Mac Cragh, Adolfo P.; Patil, Arvind S.; and Ashby, George E., 3,713,816.

Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Baglai, Vitaly Mikhailovich; and Alferov, Jury Fedorovich. Installation for making ingots and method therefor. 3,713,76, Cl. 164-52.000.

Patterson, Terry V.: *See—*
Dare, Sherman E.; Haas, Davey S.; Herold, Stanley J.; Norris, Steven R.; Patterson, Terry V.; and Sloan, Robert E., 3,713,394.

Patton, Edmond Louis: *See—*
Maher, James Bernard; Delahunty, Terry Wayne; and Patton, Edmond Louis, 3,713,794.

Patton, Thomas Henry, to Compco Corporation. Film reel clip. 3,713,602, Cl. 242-74.000.

Payne, Robert A.: *See—*
Brouwer, Frans; Englehardt, William H.; Krempel, Frank M.; and Payne, Robert A., 3,714,649.

Peacock, David E.: *See—*
Boone, Donald H.; Koss, Donald A.; and Peacock, David E., 3,713,815.

Pearson, Kenneth White, to Shipowners Refrigerated Cargo Research Association. Extensible coupling having automatic valve means. 3,713,623, Cl. 251-150.000.

Pech, R. Dean. Flow meter with extensible scale. 3,713,558, Cl. 222-20.000.

Pelissier, Jean H.: *See—*
Galmiche, Philippe M.; Pelissier, Jean H.; and Spinat, Roland R., 3,713,206.

Pelletier, Joel Albert: *See—*

Fosse, Jacuqes Andre Charles; and Pelletier, Joel Albert, 3,714,419.
Pelta, Edmond R.; and Gold, Kenneth Stewart, to Autoscan, Inc. System for testing the ignition of an internal combustion engine. 3,714,499, Cl. 315-22.000.
Penner, John. Detachable auxiliary tractor tire and wheel attachment means. 3,713,701, Cl. 301-39.00r.
Pennink, Hans: *See—*
Pilarczyk, Karol; and Pennink, Hans, 3,713,756.
Perez Perez, Carmen. Wig stand. 3,713,566, Cl. 223-66.000.
Perilhou, Jean Robert: *See—*
Auphan, Michel Joseph; and Perilhou, Jean Robert, 3,713,777.
Permalite Chemicals Limited: *See—*
Law, Malcolm John; and Jones, Horace, 3,713,999.
Persky, George: *See—*
Bartelink, Dirk Jan; and Persky, George, 3,714,473.
Petersen, Hans-Gunther; and Requardt, Heiko, to Volkswagenwerk Aktiengesellschaft. Apparatus for the determination of internal combustion engine compression pressure. 3,713,331, Cl. 73-117.200.
Petersen Industries, Inc.: *See—*
Thompson, Larry O.; Gilbert, William J.; Thompson, Louis R.; Martin, James W., Jr.; and Clements, William Lamar, 3,713,554.
Peterson, Carl L.; and Webb, Edward A., to GTE Sylvania Incorporated. Harness for supporting high pressure electric discharge tube within outer envelope and lamp formed thereby. 3,714,485, Cl. 313-25.000.
Peterson, Frank C.; and Theard, Leslie P., to Gulf Oil Corporation. Thermosettable sheet molding compound and method of making. 3,713,927, Cl. 156-62.600.
Peterson, Howard: *See—*
Smith, David R.; and Peterson, Howard, 3,714,106.
Petigara, Ramesh B.: *See—*
Yale, Harry Louis; and Petigara, Ramesh B., 3,714,201.
Petro-Tex Chemical Corporation: *See—*
Croce, Louis J.; and Barone, Bruno J., 3,714,243.
Petrocci, Alfonso N.: *See—*
Adams, Phillip; Petrocci, Alfonso N.; and Merianos, John J., 3,714,046.
Petrolite Corporation: *See—*
Herron, Francis H., 3,714,012.
Pfaff, Richard C.: *See—*
Landis, Donald H.; and Pfaff, Richard C., 3,713,261.
Pfaffle, Ernst, to Sickinger, Hans, Company. Web printing means. 3,713,420, Cl. 118-212.000.
Pfannmueller, Helmut; Urban, Friedrich; Gropper, Hans; and Gierth, Volker, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of homopolymers or copolymers of ethylene. 3,714,135, Cl. 260-86.700.
Pfeiffer, Ralph R.; and Yang, Kuo Shang, to Lilly, Eli, and Company. Recovery of cephalothin salts. 3,714,154, Cl. 260-243.00c.
Pfizer Inc.: *See—*
McManus, James M., 3,714,364.
Stam, John G., 3,714,354.
Pfleger, Hans; Bittner, Friedrich; and Meffert, Paul, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of alkali thiocyanates. 3,714,331, Cl. 425-366.000.
Pfleiderer, Wolfgang: *See—*
Zondler, Helmut; and Pfleiderer, Wolfgang, 3,714,196.
Philadelphia Quartz Company: *See—*
Lazet, Frank J., 3,713,990.
Miller, James R.; Pierce, Richard H.; Linton, Robert W.; and Wills, John H., 3,714,068.
Philbrick, Richard W.: *See—*
Berman, Elliot; and Philbrick, Richard W., 3,713,823.
Philip, Thoni V.; and Vedder, Ralph L., to Carpenter Technology Corporation. Deep air-hardened alloy steel article. 3,713,905, Cl. 148-36.000.
Phillips, Gordon Hanley: *See—*
Davis, Benjamin; and Phillips, Gordon Hanley, 3,714,352.
Phillips Petroleum Company: *See—*
Cook, Charles F., 3,714,138.
Nelson, Melvin O., 3,713,764.
Stapp, Paul R., 3,714,280.
Pianka, Max, to Murphy Chemical Company Limited, The. Dinitrophenyl ester pesticides. 3,714,230, Cl. 260-479.00s.
Picker, Patrick, to Universite de Sherbrooke. Single control valve for vacuum system. 3,713,460, Cl. 137-566.000.
Pieper, Hans D., to United States of America, Navy. Ordnance section cable harness. 3,713,390, Cl. 102-67.000.
Pierce, Ogden R.; and Greenwald, John R., to Dow Corning Corporation. Monochlorotetrafluorobenzene compounds. 3,714,275, Cl. 260-650.00f.
Pierce, Ogden R.; and Greenwald, John R., to Dow Corning Corporation. Difunctional tetrafluorobenzene. 3,714,276, Cl. 260-650.00f.
Pierce, Richard H.: *See—*
Miller, James R.; Pierce, Richard H.; Linton, Robert W.; and Wills, John H., 3,714,068.
Pierrot, Victor Charles, III, to Deere & Company. Delimbing blade. 3,713,467, Cl. 144-2.00z.
Pilarczyk, Karol; and Pennink, Hans, to Carrier Corporation. Control for gas compression apparatus. 3,713,756, Cl. 417-295.000.
Pilipchuk, Viktor Romanovich: *See—*
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,714,368.
Pilkington Brothers Limited: *See—*
Hodgkinson, Joseph B.; and Morey, Roger John, 3,713,650.
Lawrenson, Jack, 3,713,797.
Pilling, Richard L.: *See—*
Biale, Giovanni; and Pilling, Richard L., 3,714,100.
Plasti-Fiber Formulations, Inc.: *See—*
Botz, Roland, 3,714,084.
Plastic Coating Corporation, The: *See—*
Girard, Eric Lionel, 3,713,825.
Plurkowsky, Stephen W.: *See—*
Bear, David L.; and Plurkowsky, Stephen W., 3,713,252.
Pluscec, Jelka: *See—*
Yale, Harry Louis; and Pluscec, Jelka, 3,714,172.
Pneumatiques Coputchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Ducrocq, Roger; and Moreau, Charles, 3,713,410.
Podolan, Edward G.; and Przybysz, Francis C., to General Motors Corporation. Vehicle body retractable top. 3,713,689, Cl. 296-137.00b.
Pohl, Kurt: *See—*
Hess, Gunther; Martens, Gerhard; and Pohl, Kurt, 3,713,784.
Polaroid Corporation: *See—*
Fitzgerald, Maurice J., 3,713,834.
Pollitzer, Ernest L.: *See—*
Hayes, John C.; and Pollitzer, Ernest L., 3,714,281.
Pollman, Frederic W.; Frandsen, Lee R.; and Throckmorton, Charles D., Sr., to Sundstrand Corporation. Gear pump with seal plates. 3,713,759, Cl. 418-71.000.
Pollock, James Francis: *See—*
Rice, Graham; and Pollock, James Francis, 3,714,283.
Polymer Corporation, The: *See—*
Preg, Robert, 3,713,939.
Polymer Processing Research Institute Ltd.: *See—*
Yazawa, Masahide; Tani, Haruhisa; Matsumoti, Masaki; and Sasaki, Yasuo, 3,713,190.
Pontoriero, Emanuele. Projectile for smooth barrel hunting guns or rifles, with auxiliary wad provided with helical side tabs. 3,713,388, Cl. 102-38.000.
Poplin, John Milton: *See—*
Ham, Jack Wesley; and Poplin, John Milton, 3,714,572.
Porsche, Dr.-Ing. H.c.F., K.G., Firma: *See—*
Herrbrich, Bernd, 3,713,332.
Porter, Samuel, Jr.; Hart, Donald P.; and Seiner, Jerome A., to PPG Industries, Inc. Method of spraying thermoplastic paint compositions. 3,713,872, Cl. 117-75.000.
Porvair Limited: *See—*
Thomas, Brian Edward Alston, 3,713,991.
Post, Richard F.: *See—*
Hamilton, Gordon W.; Moir, Ralph W.; Osher, John E.; and Post, Richard F., 3,713,967.
Poupitch, Ougljesa Jules. Container carrier. 3,713,684, Cl. 294-87.200.
Pour-El, Akiva; and Swenson, Thomas C., to Daniels, Archer, Midland Company. Water soluble protein materials. 3,713,843, Cl. 99-79.000.
Powell, Walter E., Jr.: *See—*
Grabowski, Joseph P.; and Powell, Walter E., Jr., 3,714,652.
Powers, Jack F.: *See—*
Tung, Ching C.; and Powers, Jack F., 3,714,209.
PPG Industries, Inc.: *See—*
Ackley, Richard H., 3,713,962.
Hartzell, Rowland S.; and Gerek, Gene, 3,713,925.
Porter, Samuel, Jr.; Hart, Donald P.; and Seiner, Jerome A., 3,713,872.
Stilley, George W.; Wagner, William E.; and Kelly, Joseph D., 3,713,798.
Prapis, Frank: *See—*
Krivak, Michael T.; Reynolds, Gibson; and Prapis, Frank, 3,714,535.
Pratt, Harold J., Jr.: *See—*
Grace, Martin I.; Kroger, Harry; and Pratt, Harold J., Jr., 3,714,605.
Preg, Robert, to Polymer Corporation, The. Method of processing articles of very thin plastic film material. 3,713,939, Cl. 156-248.000.
Pressman, Gerald L.: *See—*
Crane, Hewitt D.; Pressman, Gerald L.; and Eilers, George J., 3,713,734.
Presta, Gabriel E. Golfer's head restrainer. 3,713,657, Cl. 273-190.00r.
Previti, Giuseppe; and Roncarolo, Paolo, to Fiat Societa per Azioni. Nuclear reactor fuel elements. 3,713,974, Cl. 176-78.000.
Price, Paul B.: *See—*
Fleischer, Robert L.; Price, Paul B.; Bostick, Edgar E.; and Holub, Fred F., 3,713,921.
Prijn, Cornelis. Arrangement for coupling a flash bulb holder to a camera. 3,713,370, Cl. 95-11.00l.
Prill, Arnold L.; and Tarkan, Stuart E., to Chromalloy American Corporation. Powder metallurgy sintered corrosion and heat-resistant, age hardenable nickel-chromium refractory carbide alloy. 3,713,788, Cl. 29-182.700.
Prince, Kenneth: *See—*

Coast, Geoffrey; Prince, Kenneth; Spruce, Brian; and Morgan, Vernon, 3,713,972.

Priola, Michael Anthony, to Ciba-Geigy Corporation. Weed killing compositions using 2,4-bis (isopropylamino)-6-methoxy-triazine, 2,4-bis (isopropylamino)-6-methylthio-s-triazine, pentachlorophenol and a 2,4-d compound. 3,713,806, Cl. 71-93.000.

Procor Limited: *See—*
Bembridge, Henry; and Venn-Brown, Geoffrey C., 3,713,399.

Procter & Gamble Company, The: *See—*
Lubsen, Timothy A.; Joffe, Frederick M.; Gregory, Paulee; and McSwiggin, Joseph R., 3,713,842.
Lyness, Warren I., 3,714,151.
Moccia, David E., 3,713,804.

Production Technology Inc., mesne: *See—*
Coleman, Donald F.; and Miller, Robert G., 3,714,509.

Progil: *See—*
Borrel, Philippe; and Lehureau, Jean, 3,714,007.

Prontor-Werk Alfred Gauthier G.m.b.H.: *See—*
Schill, Hermann, 3,713,372.

Propst, Billy J.: *See—*
Kirby, Robert A.; and Propst, Billy J., 3,714,576.

Przybysz, Francis C.: *See—*
Podolan, Edward G.; and Przybysz, Francis C., 3,713,689.

Puccini, Sergio E.: *See—*
Busch, John E.; and Puccini, Sergio E., 3,714,379.

Pugh, John. Charge/discharge arrangements for nuclear reactor. 3,713,550, Cl. 214-27.000.

Pulick, Emil A.: *See—*
Balje, Otto Erich; Bouchard, Constant L.; Knowles, James; Kosacheff, Dimitri; Pulick, Emil A.; Pulick, Michael A.; and Topouzian, Armen, 3,713,294.

Pulick, Michael A.: *See—*
Balje, Otto Erich; Bouchard, Constant L.; Knowles, James; Kosacheff, Dimitri; Pulick, Emil A.; Pulick, Michael A.; and Topouzian, Armen, 3,713,294.

Purdy, Paul J.: *See—*
Seaberg, David H.; and Purdy, Paul J., 3,713,557.

Quartarone, Irene E.: *See—*
Quartarone, Joseph R.; and Quartarone, Irene E., 3,713,187.

Quartarone, Joseph R.; and Quartarone, Irene E. Apparatus and method for forming meatballs. 3,713,187, Cl. 17-32.000.

Quick, Richard C.: *See—*
Leonard, James H.; and Quick, Richard C., 3,714,383.

Quittenton, Richard C., to Labatt, John, Limited. Process for making a brewers' wort. 3,713,840, Cl. 99-51.000.

Radford, Herschel D.: *See—*
Bertolacini, Ralph J.; and Radford, Herschel D., 3,714,032.

Rairden, John R., III, to General Electric Company. Refractory metal/refractory metal nitride resistor films by cathode sputtering. 3,714,013, Cl. 204-192.000.

Rakestraw, Roy R. Movable chair entertainment unit. 3,713,652, Cl. 272-1.00r.

Rakucewicz, John J., to Kinematics and Controls Corporation. Article delivery systems for vending machines. 3,713,715, Cl. 312-45.000.

Ralston Purina Company: *See—*
Farr, Marvin Paul, 3,714,560.

Ramovist, Lars Henry, to Rederiaktiebolaget Nordstjernan. Cemented carbide compositions and process for producing the same. 3,713,789, Cl. 29-182.800.

Ramsay, Alston, Jr., to Celanese Corporation. Fabric molding. 3,713,936, Cl. 156-242.000.

Ramseier & Jenzer A.G.: *See—*
Knothe, Lutz; and Loeblein, Engelbert, 3,713,690.

Randall, David I.; and Wynn, Robert W., to GAF Corporation. Plant growth method and composition using 2-chloro-ethyl phosphonic diamide. 3,713,805, Cl. 71-86.000.

Randolph, Glenn Ray: *See—*
McCracken, Madelyn Iris; Randolph, Glenn Ray; and Watking, Dwight Wayland, 3,713,692.

Ranger Pneumatic Tool Company: *See—*
Goodrich, Robert S., 3,713,365.

Ranks Hovis McDougall Limited: *See—*
Emery, Anthony Nicholas, 3,713,982.

Raphel, Julio Cesar: *See—*
Berryman, Robert Dean; Erickson, Donald Henry; and Raphel, Julio Cesar, 3,714,380.

Rapoport, Henry, to University of California, The Regents of the. Lactam process. 3,714,156, Cl. 260-243.00c.

Rash, James T., to Mouldings, Inc. Dryer conveyor means. 3,713,421, Cl. 118-404.000.

Rasquinmadison, John R.; and Estes, Marvin F., to United States of America, National Aeronautics and Space Administration. Process for making diamonds. 3,714,332, Cl. 423-446.000.

Ratouis, Roger: *See—*
Boissier, Jacques Robert; and Ratouis, Roger, 3,714,190.

Rausch, John J.: *See—*
Van Thyne, Ray J.; and Rausch, John J., 3,713,906.
Van Thyne, Ray J.; and Rausch, John J., 3,713,907.

Rauterkus, Karl Josef; and Seip, Detlev, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of aqueous dispersions of vinyl esters. 3,714,098, Cl. 260-29.6rw.

Ray, Joseph, to American Totalisator Company, Inc. Machine for producing business forms. 3,713,674, Cl. 282-13.000.

Raychem Corporation: *See—*
Scalco, Emanuele, 3,714,116.

Raymond Lee Organization, Inc., The: *See—*
Evans, Walker, 3,714,394.

Raytheon Company: *See—*
Fuller, Roger L.; Gustafsson, Sven G.; Harris, Derek V.; Kaye, Robert K.; and Oliver, Joseph J., 3,714,650.

RCA Corporation: *See—*
Craft, Jack, 3,714,583.
Dingwall, Andrew Gordon Francis; and Jorgensen, John Mulliner, 3,714,638.
Fulton, Thomas Philip; and Di Luca, Henry, 3,713,886.
Ham, Jack Wesley; and Poplin, John Milton, 3,714,572.
Kell, Ray D., 3,714,490.
Kiess, Helmut Gustav, 3,713,822.
Maley, James John, 3,713,884.
Shaw, Joseph Michael, 3,714,521.

RCA Limited: *See—*
McIntyre, Robert John; and Sprigings, Howard Charles, 3,714,491.

Recupito, Pasquale: *See—*
Dillman, Ned E.; Gilliund, Arden G.; Muth, Victor O.; and Recupito, Pasquale, 3,714,627.

Rederiaktiebolaget Nordstjernan: *See—*
Ramovist, Lars Henry, 3,713,789.

Redford, Robert L., to International Harvester Company. Automatic disk harrow hinge locking device. 3,713,495, Cl. 172-456.000.

Reece, Milton A. Connector bracket for sawhorses or the like. 3,713,512, Cl. 182-226.000.

Reen, Orville W., to Allegheny Ludlum Industries, Inc. Method of producing powder metal articles. 3,713,817, Cl. 75-211.000.

Regan, Bernard M., to Baxter Laboratories, Inc. Production of polyfluoropropanols. 3,714,271, Cl. 260-633.000.

Regency Electronics, Inc.: *See—*
Koch, Richard C., 3,714,585.

Rehl, William Richard: *See—*
Jaffe, Gerald Myer; and Rehl, William Richard, 3,714,242.

Reichhold Chemicals, Inc.: *See—*
Bayha, Charles Edward; and Madden, Thomas Raymond, 3,714,257.
Bayha, Charles Edward; and Madden, Thomas Raymond, 3,714,258.

Reichhold-Albert-Chemie Aktiengesellschaft: *See—*
Hochbach, Friedrich, 3,713,297.

Reid, James Angus Wilson, to Imperial Chemical Industries Limited. Antimony compound catalyzed ethylene glycol polyesterification with added second diol. 3,714,126, Cl. 260-75.00r.

Reide, Louis: *See—*
Leclerco, Jacques; and Reide, Louis, 3,713,608.

Reif, Robert H.: *See—*
Macey, Frank G.; and Reif, Robert H., 3,714,397.

Reimels, Harry G., to Codman & Shurtleff, Inc. Hemostatic clip holder. 3,713,533, Cl. 206-56.0df.

Reiniger, Friedrich; von Hacht, Reinhard; and Lemmrich, Jurgen, to U.S. Philips Corporation. Apparatus for taking section radiographs. 3,714,427, Cl. 250-61.500.

Reinnagel, Richard E., to Cornell Aeronautical Laboratory, Inc. Droplet sizing and detecting apparatus and method using a magnetic recording. 3,714,564, Cl. 324-71.0cp.

Reischl, Artur; and Dieterich, Dieter, to Farbenfabriken Bayer Aktiengesellschaft. Coarsely dispersed, sedimenting aqueous polyurethane dispersions. 3,714,095, Cl. 260-29.2tn.

Reiss, Walter B., to Gulf Oil Canada Limited. Polymer encapsulation of finely divided solids. 3,714,102, Cl. 260-29.60r.

Relles, Howard M.; Orlando, Charles M.; and Schluenz, Robert W., to General Electric Company. Preparation of bis(dibromoethyl)benzenes. 3,714,278, Cl. 260-651.00r.

Renault, Jean A.: *See—*
Beaufour, Albert H.; and Renault, Jean A., 3,714,165.

Renzoni, Ruggero: *See—*
Dolci, Gioacchino,; and Renzoni, Ruggero, 3,714,323.

Repco Products Corporation: *See—*
Bunten, Theodore M., 3,714,369.

Requardt, Heiko: *See—*
Petersen, Hans-Gunther; and Requardt, Heiko, 3,713,331.

Resch, Richard J.: *See—*
Hendrickson, Philip J.; and Resch, Richard J., 3,713,618.

Reviel, Benny L., to Lek Trol Incorporated. Personal insulin cooler. 3,713,302, Cl. 62-3.000.

Rex Chainbelt Inc.: *See—*
Butzow, Neil W.; and Harris, Bernard, 3,713,932.

Reynolds, Charles Edward, to AMP Incorporated. Waterproof rocker arm switch assembly. 3,713,670, Cl. 280-168.00g.

Reynolds, David L.: *See—*
Youngblood, Douglas J.; and Reynolds, David L., 3,714,024.

Reynolds, Gary R., to Motorola, Inc. Broadband power amplifier with multiple stages connected by balun transformers. 3,714,597, Cl. 330-14.000.

Reynolds, Gibson: *See—*
Krivak, Michael T.; Reynolds, Gibson; and Prapis, Frank, 3,714,535.

Reynolds Metals Company: *See—*
Kibby, Robert M., 3,714,002.
Lesko, Frank J., 3,713,318.
Matthews, Raymond A., 3,713,319.

Saurs, Richard J., 3,713,941.
Reznitsky, Alexandr Mikhailovich: *See—*
Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,714,368.
Rheinmetall G.m.b.H.: *See—*
Seifried, Paul, 3,713,242.
Rhoades, Vaughan W., to Cities Service Oil Company. Uranium solution mining process. 3,713,698, Cl. 299-4.000.
Rhone-Poulenc S.A.: *See—*
Garet, Pierre, 3,714,337.
Rice, Graham; and Pollock, James Francis, to United Kingdom Atomic Energy Authority. Method of heating fluids. 3,714,283, Cl. 260-675.500.
Richards, Mildred C.: *See—*
Samour, Carlos M.; and Richards, Mildred C., 3,714,256.
Richardson, Elwin J., Jr., to Bristol Myers Company. Process for the decolorization of 7-a-(4-pyridylthio)acetamido) cephalos-poranic acid. 3,714,157, Cl. 260-243.00c.
Richardson-Merrell Inc.: *See—*
Parker, Roger Alan, 3,714,191.
Ricoh Co., Ltd.: *See—*
Kurihara, Makoto; and Akiyama, Hideaki, 3,713,371.
Shiratory, Yoshitaka; and Kaneko, Hirokazu, 3,713,374.
Riddell, Inc.: *See—*
Margan, Gerard E., 3,713,640.
Ridings, Willis A., Jr. Variable meter shunt. 3,714,568, Cl. 324-126.000.
Riedel, Anton: *See—*
Sauer, Theo; and Riedel, Anton, 3,713,274.
Rieter, Robert F., to Kimberly-Clark Corporation. Non-foaming two-phase contactor. 3,713,629, Cl. 261-112.000.
Riggs, Olen L., Jr.; and Barnett, David W., to Continental Oil Company. Method and apparatus for cathodic protection. 3,714,004, Cl. 204-147.000.
Ring, Clinton E., to General Electric Company. Air-conditioner air-directing means. 3,713,376, Cl. 98-110.000.
Rips, Richard, to Institut National de la Sante et de la Recherche Medicale and Les Laboratoires Millot. N,N-diethyl(2-allyl-tert-butyl substituted-phenoxy) acetamides. 3,714,250, Cl. 260-559.00b.
Rise, Donald J. Differential pressure thermoforming apparatus for forming large articles such as trailer bodies and boats. 3,713,765, Cl. 425-384.000.
Rishel, Paul A.: *See—*
Morgan, Robert A.; and Rishel, Paul A., 3,714,619.
Risky, Frank A., to GTE Automatic Electric Laboratories, Incorporated. Electro-magnetic current-sensing scanpoint matrix having means for detecting and isolating electrical failures the matrix. 3,714,556, Cl. 324-34.00r.
Robbins, Harold. Motorcycle to towing vehicle hitch. 3,713,672, Cl. 280-292.000.
Robert, Labey: *See—*
Claude, Gueremy; Robert, Labey; and Roger, Thevenot, 3,714,357.
Roberts, Heinz Theodore Felix. Combination credit card. 3,713,235, Cl. 40-2.200.
Roberts, John A.; Roberts, Peter R.; King, Alwyn H.; and Danzey, Lee B., to Brunswick Corporation. Method of forming collimated hole structure. 3,713,202, Cl. 29-423.000.
Roberts, Peter R.: *See—*
Roberts, John A.; Roberts, Peter R.; King, Alwyn H.; and Danzey, Lee B., 3,713,202.
Roberts, Victor I.; and Messervey, Clifford H., to Bordon Company, The. Cam gear pocket opening mechanism. 3,713,326, Cl. 73-41.000.
Robertshaw Controls Company: *See—*
Nurnberg, Richard K.; and Koch, Erich O., 3,714,646.
Robicheaux, Ronald J. Well servicing apparatus. 3,713,483, Cl. 166-117.500.
Robinson, Charles C.: *See—*
Shaw, Robert R.; and Robinson, Charles C., 3,714,059.
Roche, William J., to GTE Sylvania Incorporated. DC fluorescent lamp with improved efficiency. 3,714,492, Cl. 313-108.00r.
Rockey, Kenneth William, to Albright & Wilson Limited. Novel polyester resins containing spiroacetal units. 3,714,291, Cl. 260-861.000.
Roegler, Manfred: *See—*
Dahm, Manfred; Kraft, Karl-Josef; and Roegler, Manfred, 3,714,080.
Roelofs, Henry M.; and Lafferty, William J., to Nalco-Chemical Company. Shell molds. 3,713,475, Cl. 164-26.000.
Rogalski, Theodore, to Amalgamated Music Enterprises, Inc. Code controlled broadcasting system. 3,714,575, Cl. 325-53.000.
Roger, Thevenot: *See—*
Claude, Gueremy; Robert, Labey; and Roger, Thevenot, 3,714,357.
Rogers, William I.: *See—*
Morris, Horton Harold; McMahan, J. Raymond; and Rogers, William I., 3,713,593.
Rohm & Haas Company: *See—*
Minton, Robert G.; and Melamed, Sidney, 3,714,315.
White, R. Winslow, 3,714,234.
Rollway Bearing Company, Inc.: *See—*
Derner, William J.; Stewart, Harold E.; Root, Lawrence E.; and Goodelle, Roger A., 3,713,712.
Romans, John F. Exercising device with rotatable handbar and pivotal turntable. 3,713,653, Cl. 272-57.00r.
Romberger, Karl A.; and Braunstein, Jerry, to United States of America, Atomic Energy Commission. Electrochemical apparatus for determination of molten salt composition. 3,714,014, Cl. 204-195.00r.
Roncarolo, Paolo: *See—*
Previti, Giuseppe; and Roncarolo, Paolo, 3,713,974.
Root, Lawrence E.: *See—*
Derner, William J.; Stewart, Harold E.; Root, Lawrence E.; and Goodelle, Roger A., 3,713,712.
Roper Corporation: *See—*
Dankel, Douglas D.; and Buckhouse , Norman O., 3,713,284.
Rose, James S.: *See—*
Farrissey, William J., Jr.; Rose, James S.; and Sayigh, Adnan A. R., 3,714,130.
Rosen, Alfred H.; and Smith, Lester C., to Cognos Corporation. Method and apparatus for counting and classifying microscopic particles. 3,714,372, Cl. 178-6.800.
Rosenberg, David S., to Hooker Chemical Corporation. Process for preparing bromophenyl norbornenes. 3,714,274, Cl. 260-649.00r.
Rosette, King H.: *See—*
Hofstadter, Robert; Kramer, Gerald R.; Farukhi, Mohammed R.; and Rosette, King H., 3,714,057.
Rosevear, Allan F.; and Acampora, Ferdinando M., to North American Rockwell Corporation. Method of producing a tunnel diode. 3,713,909, Cl. 148-179.000.
Rosi, David: *See—*
Archer, Sydney; and Rosi, David, 3,714,167.
Ross, Donald L.: *See—*
Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., 3,714,254.
Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., 3,714,260.
Ross, Gerald F.; and Susman, Leon, to Sperry Rand Corporation. Array antenna signal processing system. 3,714,655, Cl. 343-100.00r.
Ross, Theron A., Jr.; and Youngman, Jon W., to Eastman Kodak Company. Voltage regulation circuit. 3,714,547, Cl. 323-24.000.
Rossinger, Sigurd: *See—*
Kleiner, Hans-Jerg; and Rossinger, Sigurd, 3,714,009.
Roth, Shirley H.; Green, Joseph; and Seipel, John J., to Cities Service Company. Novel intumescent coating composition. 3,714,081, Cl. 260-2.5fp.
Roth, Shirley H.; Green, Joseph; and Seipel, John J., to Cities Service Company. Intumescent coating composition. 3,714,082, Cl. 260-2.5fp.
Rothier, Joseph Philip. Building for parking motor vehicles. 3,713,549, Cl. 214-16.10a.
Rotor Electric Company, Limited: *See—*
Chamberlain, James; and Bradley, John, 3,713,346.
Rottmayer, Earl; Carman, Robert R.; and Gibson, James O., to Goodyear Aerospace Corporation. Insensitive thermal distortion structures. 3,713,959, Cl. 161-59.000.
Roussel-UCLAF: *See—*
Boissier, Jacques Robert; and Ratouis, Roger, 3,714,190.
Clemence, Francois; and Le Martret, Odile, 3,714,163.
Martel, Jacques; and Buendia, Jean, 3,714,153.
Nedelec, Lucien; and Torelli, Vesperto, 3,714,203.
Rowton, Richard Lee; and Yeakey, Ernest Leon, to Jefferson Chemical Company, Inc. Polyurea coating based on cyanoalkylated polyoxyalkylene polyamines. 3,714,128, Cl. 260-77.5ch.
Royal Industries, Inc.: *See—*
Moore, Wesley D.; and Baker, Silveus M., 3,714,479.
Rozner, Alexander G.: *See—*
Helms, Horace H.; Rozner, Alexander G.; and Spencer, Dana E., 3,713,636.
Rucker, Dieter: *See—*
Wolfle, Rudolf; Rucker, Dieter; and Lauerer, Uta, 3,713,913.
Ruckle, Duane L.; and Sprague, Robert A., to United Aircraft Corporation. Method for diffusion bonding utilizing superplastic interlayer. 3,713,207, Cl. 29-498.000.
Ruget, Gabriel. Electromagnetic clutches. 3,713,519, Cl. 192-53.00d.
Runions, Adrian C.: *See—*
Crow, Rufus C., Jr.; and Runions, Adrian C., 3,713,266.
Russell, Charles R.: *See—*
Buchanan, Russell A.; and Russell, Charles R., 3,714,087.
Russell, Michael King. Drilling devices. 3,713,500, Cl. 175-73.000.
Rutherford, Robert E., Jr.: *See—*
Grosso, Patrick F.; Rutherford, Robert E., Jr.; and Sargent, Donald E., 3,714,011.
Ruyle, William V.; Sarett, Lewis H.; and Matzuk, Alexander R., to Merck & Co., Inc. Phenyl benzoic acid compounds. 3,714,226, Cl. 260-473.00s.
Ryan, Patrick W.: *See—*
Verdol, Joseph A.; Ryan, Patrick W.; and Carrow, Donald J., 3,714,110.
Ryan, William P.: *See—*
Miller, Carl J.; and Ryan, William P., 3,714,213.
Saari, Walfred S.; and Miller, Charles G.; deceased (by Miller, Ruth A.; executrix), to Merck & Co., Inc. Esters of 3-hydroxy-a-(1-aminoethyl)-benzyl alcohol. 3,714,229, Cl. 260-477.000.
Sabadash, Julia Sergeevna,: *See—*

Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.

Sach, George Sidney: *See*—
Hills, Derek William; and Sach, George Sidney, 3,714,224.

Sackett, A. J., & Sons Company, The: *See*—
Sackett, Walter J., Sr., 3,713,277.

Sackett, Walter J., Sr., to Sackett, A. J., & Sons Company, The. Fog impingement scrubbing system. 3,713,277, Cl. 55-223.000.

Sadler, Loren G., to Sperry Rand Corporation. Knife bracket for forage harvester cutterhead. 3,713,471, Cl. 83-523.000.

Sagawa, Naotoshi: *See*—
Nitta, Haruo; and Sagawa, Naotoshi, 3,714,312.

SAGE George E., to Honeywell Inc. Fixed memory integrater. 3,714,581, Cl. 325-473.000.

Sahara, Masayoshi; and Nanba, Yasuhiro, to Minolta Camera Kabushiki Kaishi. Constant current circuit constituted on a monolithic. 3,714,543, Cl. 323-4.000.

Saito, Seiichi: *See*—
Shigezane, Suzu; Naoi, Fusaji; Saito, Seiichi; Kojima, Michio; and Ishida, Ryuichi, 3,714,175.

Saito, Shizuo: *See*—
Sato, Shui; Sakamoto, Eiichi; Saito, Shizuo; Sakazume, Kaiichiro; and Kaneko, Tokuzo, 3,713,835.

Sakai, Takeyo: *See*—
Matsuda, Kazuo; Tanaka, Yoshiaki; Sakai, Takeyo; and Iwasa, Ichiro, 3,714,266.

Sakakibara, Shigeru; Kato, Takaaki; and Ito, Katsunori, to Toyota Jidosha Kogyo Kabushiki Kaisha Nippondenso Kabushiki Kaisha. Electrical automatic shift control system with hilly country detecting unit. 3,713,351, Cl. 74-645.000.

Sakakibara, Yasuhito: *See*—
Ohrui, Tetsuya; Sakakibara, Yasuhito; and Tanaka, Junji, 3,714,333.

Sakamoto, Eiichi: *See*—
Sato, Shui; Sakamoto, Eiichi; Saito, Shizuo; Sakazume, Kaiichiro; and Kaneko, Tokuzo, 3,713,835.

Sakazume, Kaiichiro: *See*—
Sato, Shui; Sakamoto, Eiichi; Saito, Shizuo; Sakazume, Kaiichiro; and Kaneko, Tokuzo, 3,713,835.

Sako, Fumio F.: *See*—
Davidson, Roger; and Sako, Fumio F., 3,713,540.

Sakural, Shigekata: *See*—
Someya, Teruo; and Sakural, Shigekata, 3,714,425.

Salihi, Jalal T.: *See*—
Shimer, Daniel W.; and Salihi, Jalal T., 3,713,504.

Salomone, Georges Henri. Method and composition for emulsifying petroleum with a view to preparing a culture medium for micro-organisms. 3,714,063, Cl. 252-312.000.

Samarin, Alexandr Mikhailovich: *See*—
Cherkasov, Petr Alexeevich; Kuznetsov, Evgeny Mikhailovich; Averin, Vyacheslav Vasilievich; and Samarin, Alexandr Mikhailovich, 3,713,995.

Samour, Carlos M.; and Richards, Mildred C., to Kendall Company, The. Diallyl and dimethallyl alkyl lipophilic benzyl ammonium halides. 3,714,256, Cl. 260-567.60m.

Sample, Donald W. Electrical wall receptacle cover. 3,714,616, Cl. 339-159.00r.

Sanders Associates, Inc.: *See*—
Sands, Timothy B., 3,713,345.

Sandhagen, Jurgen, to Volkswagenwerk Aktiengesellschaft. Exhaust gas return means for internal. 3,713,428, Cl. 123-119.00a.

Sandor, Andrew J.: *See*—
Walsh, Kenneth A.; and Sandor, Andrew J., 3,713,810.

Sandoz-Wander, Inc.: *See*—
Griot, Rudolf G., 3,714,362.
Manning, Robert E., 3,714,363.

Sands, Timothy B., to Sanders Associates, Inc. Mechanical timer fail-safe mechanism. 3,713,345, Cl. 74-1.500.

Santaniello, Anthony F.: *See*—
Mazzeo, Michael P.; and Santaniello, Anthony F., 3,714,092.

Sarett, Lewis H.: *See*—
Ruyle, William V.; Sarett, Lewis H.; and Matzuk, Alexander R., 3,714,226.

Sarett, Lewis H.; and Hannah, John, to Merck & Co., Inc. 5-Arylphenyl sulfonic acids. 3,714,232, Cl. 260-479.00r.

Sargent & Greenleaf, Inc.: *See*—
Miller, Harry C., 3,713,309.

Sargent, Donald E.: *See*—
Grosso, Patrick F.; Rutherford, Robert E., Jr.; and Sargent, Donald E., 3,714,011.

Sargis, John R., to Addressograph-Multigraph Corporation. Toner cleaning apparatus for a photocopy machine. 3,713,736, Cl. 355-15.000.

Sarnoff, Stanley J., to Survival Technology, Inc. Self-applied pneumatically actuated pressure. 3,713,446, Cl. 128-327.000.

Sasaki, Hiromu: *See*—
Matsuo, Yoshihiro; Sasaki, Hiromu; and Hayakawa, Shigeru, 3,713,853.

Sasaki, Yasuo: *See*—
Yazawa, Masahide; Tani, Haruhisa; Matsumoti, Masaki; and Sasaki, Yasuo, 3,713,190.

Sasakura, Tadao, to Nitto Boseki Co., Ltd. Method for producing highly crimped viscose rayon. 3,713,964, Cl. 161-173.000.

Sato, Akihiko, to Nippon Kogaku K.K. Apparatus for releasing the shutter driving mechanism of a photographic camera to obtain long exposure time. 3,713,373, Cl. 95-53.00r.

Sato, Akira: *See*—
Hayashi, Jun; and Sato, Akira, 3,713,828.

Sato, Hiroshi: *See*—
Kuwabara, Takeo; Kiwaki, Hisakatsu; Sato, Hiroshi; and Onoda, Yoshimitsu, 3,714,541.

Sato, Masamichi; and Fukushima, Osamu, to Fuji Photo Film Co., Ltd. Apparatus for developing an electrostatic latent image by liquid development. 3,713,422, Cl. 118-637.000.

Sato, Masanori: *See*—
Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshio; Kawanishi, Masazumi; Sato, Masanori; Hoshiyama, Masao; and Nagao, Taku, 3,714,171.

Sato, shozo; Otaka, Yoshihisa; and Takigawa, Yukio, to Mitsubishi Chemical Industries Limited. A-Umina hydrate, alumina and a method for the manufacture thereof. 3,714,343, Cl. 11-20-72.

Sato, Shui; Sakamoto, Eiichi; Saito, Shizuo; Sakazume, Kaiichiro; and Kaneko, Tokuzo, to Konishiroku Photo Industry Co., Ltd. Light-sensitive supersensitized silver halide photographic material. 3,713,835, Cl. 96-124.000.

Sato, Yoshimasa, to Ikegai Tekko Kabushiki Kaisha. Sealing equipment for a flim with means for holding-up end flaps thereof. 3,713,269, Cl. 53-373.000.

Satta, Orazio, to Alfa Romeo S.p.A. Fuel supply device for a rotary (wankel) internal combustion-engine. 3,713,425, Cl. 123-8.130.

Saucy, Gabriel, to Hoffmann-La Roche Inc. Bicyclic polyketone intermediates. 3,714,262, Cl. 260-586.00h.

Sauer, Theo; and Riedel, Anton. Apparatus for conveying and degassing a viscous liquid. 3,713,274, Cl. 55-164.000.

Saurs, Richard J., to Reynolds Metals Company. Method of covering books with heat sealable thermoplastic material. 3,713,941, Cl. 156-251.000.

Savageau, Robert George: *See*—
Ackerman, Joseph Francis; Beerli, George; Savageau, Robert George; and Weisfeld, Joseph, 3,713,864.

Sawahara, Masao: *See*—
Shiba, Keisuke; Hinata, Masanao; and Sawahara, Masao, 3,713,832.

Sawyer, Elbert M.; and Kelly, Fred H., to General Motors Corporation. Starting mechanism. 3,714,450, Cl. 290-37.000.

Say, Donald L.: *See*—
Johnson, Alfred D.; Say, Donald L.; and Smithgall, Harry E., 3,714,489.

Sayigh, Adnan A. R.: *See*—
Farrissey, William J., Jr.; Rose, James S.; and Sayigh, Adnan A. R., 3,714,130.

Scalco, Emanuele, to Raychem Corporation. Polyimide compositions. 3,714,116, Cl. 260-45.90r.

Scarfone, Tommaso F.: *See*—
Harris, Bradford Foster; and Scarfone, Tommaso F., 3,713,513.

Schaefer, Horst; and Neises, Helmut, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Coating colors containing satin white with good viscosity stability. 3,714,086, Cl. 260-17.00r.

Schafer, George; and Morse, Hugh B., to Fibreboard Corporation. Apparatus for heat sealing cartons. 3,713,952, Cl. 156-497.000.

Schaffner, Carl P.: *See*—
Gordon, Harry W.; and Schaffner, Carl P., 3,714,348.

Schaumburg, Georges. Method of and apparatus for applying an anticorrosion coating to a hot-formed metal body. 3,713,866, Cl. 117-50.000.

Scheffer, Harry, to Kruger, Harry, G.m.b.H. Pumping device. 3,713,755, Cl. 417-258.000.

Scheidweiler, Andreas, to Cerberus AG. Ionization fire alarm. 3,714,641, Cl. 340-237.00s.

Scheiter, Milton H., to General Motors Corporation. Transmission. 3,713,353, Cl. 74-730.000.

Schellenberg, James M., to Westinghouse Electric Corporation. Temperature stabilized composite YIG filter process. 3,713,210, Cl. 29-593.000.

Schenck Corporation: *See*—
Schenck, Robert L.; Schenck, George E.; and Senft, Frank W., 3,713,317.

Schenck, George E.: *See*—
Schenck, Robert L.; Schenck, George E.; and Senft, Frank W., 3,713,317.

Schenck, Robert L.; Schenck, George E.; and Senft, Frank W., to Schenck Corporation. Bending machine. 3,713,317, Cl. 72-217.000.

Schering Aktiengesellschaft: *See*—
Hofmeister, Helmut; Steinbeck, Hermann; and Wiechert, Rudolf, 3,714,207.

Scheuzger, Karl: *See*—
Metzger, Karl; and Scheuzger, Karl, 3,714,198.

Schill, Hermann, to Prontor-Werk Alfred Gauthier G.m.b.H. Photographic shutter with reciprocating shutter blade driving member and electronic timing device. 3,713,372, Cl. 95-53.0eb.

Schlage Lock Company: *See*—
Neary, Ralph E., 3,713,683.

Schlapfer, Hans, to Ciba-Geigy Corporation. Arylvinyl-v-triazoles, their use for the optical brightening of organic materials and process for their production. 3,714,152, Cl. 260-240.00d.

Schlatter, Gerald Lance: *See—*
Miller, Charles Eveleigh; and Schlatter, Gerald Lance, 3,713,324.

Schlatter, James M., to Searle, G. D. & Co. Optionally substituted aspartyl cyclohexylalanine lower alkyl esters, compositions and method. 3,714,139, Cl. 260-112.500.

Schleicher GmbH & Co.: *See—*
Haufe, Werner, 3,713,285.

Schluenz, Robert W.: *See—*
Relles, Howard M.; Orlando, Charles M.; and Schluenz, Robert W., 3,714,278.

Schlumberger Technology Corporation: *See—*
Mickler, Brian E., 3,714,623.

Schmid, Julius, Inc.: *See—*
Gordon, Harry W., 3,714,347.
Gordon, Harry W.; and Schaffner, Carl P., 3,714,348.

Schmidt, Heiner, to U.S. Philips Corporation. Integrated monolithic semiconductor circuit with controlled crystal temperature. 3,714,527, Cl. 317-235.00r.

Schmidt, Paul Herman: *See—*
Eisenberger, Peter Michael; and Schmidt, Paul Herman, 3,714,420.

Schmitz, William David, to Bio-Dynamics, Inc. Centrifuge clinical chemistry analysis system. 3,713,775, Cl. 23-253.00r.

Schnabel, Wilhelm J.; Kober, Ehrenfried H.; and Kraus, Theodore C., to Olin Mathieson Chemical Corporation. Process for preparing aromatic isocyanates. 3,714,216, Cl. 260-453.0pc.

Schnake, Friedrich: *See—*
Starck, Axel Von; and Schnake, Friedrich, 3,713,639.

Schneider, Kurt: *See—*
Herman, Karl-Heinz; and Schneider, Kurt, 3,714,108.

Schneider, William P.: *See—*
Lincoln, Frank H.; Schneider, William P.; and Spero, George B., 3,714,353.

Schnyder, Aux P. Mechanized storage silo. 3,713,552, Cl. 214-17.0cb.

Schober, Donald L.; McGrath, James E.; and Matzner,Markus, to Union Carbide Corporation. Thermoplastic polyhydroxy ethers modified with polyamides. 3,714,289, Cl. 260-830.00p.

Schroder, Johann; and Van der Sluys, Willem Ludovicus Nicolaas, to U.S. Philips Corporation. Method of producing heat in a chemical reactor. 3,713,920, Cl. 149-109.000.

Schukin, Mikhail Ivanovich: *See—*
Apsit, Voldemar Voldemarovich; Kokle, Juris Leovich; Skrutzitis, Karl Ernestovich; and Schukin, Mikhail Ivanovich, 3,714,480.

Schultze, Edward F.: *See—*
Lichte, Henry P., Jr.; and Schultze, Edward F., 3,713,482.

Schwaab Label Company, Inc.: *See—*
Nettesheim, Raphael D., 3,714,308.

Schwartz, Bertram, to Bell Telephone Laboratories, Incorporated. Gallium arsenide field effect structure. 3,713,912, Cl. 148-187.000.

Schwartz, Reinhard: *See—*
Knapp, Heinrich; and Schwartz, Reinhard, 3,713,430.

Schwartzbeck, Richard A., to Gulf Research & Development Company. Herbicidal method for combating shattercane. 3,713,807, Cl. 71-93.000.

Schwarzkopf, Gabriel: *See—*
Gunten, Adeline Von; and Schwarzkopf, Gabriel, 3,714,408.

Schweiger, Richard G.; and Muller, Siegfried A., to Grain Processing Corporation. Process for extracting full fat soybean flakes or meal. 3,714,210, Cl. 260-412.800.

Schweitzer, John C.; and Junak, Edward M., to Delta Products, Inc. Controlled variable spark capacitor discharge ignition system. 3,714,507, Cl. 315-209.0cd.

Schwieter, Ulrich: *See—*
Gutmann, Hugo; Manz, Ulrich; and Schwieter, Ulrich, 3,714,367.

Schwinn Bicycle Company: *See—*
Brilando, Frank P., 3,713,350.

Scibbe, Harold R.: *See—*
Koppl, Ernest R.; and Scibbe, Harold R., 3,713,704.

Scott Paper Company, The: *See—*
Smith, Johanna Wilhelmina V. O., 3,714,107.

Scovill Manufacturing Company: *See—*
Christensen, Arthur C., 3,713,628.

Scrafford, Robert L.; and Erdmann, M. Otto, to International Telephone and Telegraph Corporation. Antenna mounting structure. 3,714,660, Cl. 343-757.000.

Seaberg, David H.; and Purdy, Paul J., to Case, J. I., Company. Method and apparatus for positioning bucket loader. 3,713,557, Cl. 214-763.000.

Seaboard Fabricators, Inc.: *See—*
Van Dalen, Leonard; and Gadren, George S., 3,713,215.

Searle, G. D. & Co.: *See—*
Schlatter, James M., 3,714,139.
Tweit, Robert C., 3,714,179.

Searls, Charles E., to General Telephone Company of California. Method and apparatus for running telephone cable. 3,713,613, Cl. 248-49.000.

Sease, John D.: *See—*
Davis, Francis C.; Cannon, Donald D.; Furman, Francis J., Jr.; and Sease, John D., 3,714,305.

Sebestyen, Thomas M., to Ford Motor Company. Thermocouple probe. 3,713,899, Cl. 136-233.000.

Secretary of State for Defence, mesne: *See—*
Johnson, Christopher Linley; Whitmarsh, John Robert William; and Basford, Kenneth Arnold, 3,713,344.

Segerdahl, Roy R.; and Erb, Theodor, to Sperry Rand Corporation Ford Instrument Company. Device for measuring accelerations. 3,713,343, Cl. 73-517.00r.

Seifert, Peter: *See—*
Blakley, Earl T.; Chupka, David E.; Harbron, Donald L., Jr.; Marsh, Paul G.; and Seifert, Peter, 3,713,594.

Seifert, Roman: *See—*
Feist, Wieland; Navratil, Peter; and Seifert, Roman, 3,713,612.

Seiferth, Oscar E.: *See—*
Grindrod, Paul E.; Goller, Robert L.; and Seiferth, Oscar E., 3,713,849.

Seifried, Paul, to Rheinmetall G.m.b.H. Safety device for small arms. 3,713,242, Cl. 42-70.00e.

Seiner, Jerome A.: *See—*
Porter, Samuel, Jr.; Hart, Donald P.; and Seiner, Jerome A., 3,713,872.

Seip, Detlev: *See—*
Rauterkus, Karl Josef; and Seip, Detlev, 3,714,098.

Seipel, John J.: *See—*
Roth, Shirley H.; Green, Joseph; and Seipel, John J., 3,714,081.
Roth, Shirley H.; Green, Joseph; and Seipel, John J., 3,714,082.

Sekiguchi, Toshio: *See—*
Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshio; Kawanishi, Masazumi; Sato, Masanori; Hoshiyama, Masao; and Nagao, Taku, 3,714,171.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Nakanishi, Osamu; and Tanaka, Ikuo, 3,714,132.

Selco Mining Corporation Limited, mesne: *See—*
McNereny, John J., 3,714,562.

Selin, Terry G.: *See—*
Hamilton, Stephen B.; Beers, Melvin D.; Berger, Abe; and Selin, Terry G., 3,714,089.

Sellstedt, John H.; and Bell, Stanley C., to American Home Products Corporation. 6-(2,5-Dioxo-4-phenyl-n-substituted-4-imidazolidinecarboxamido) penicillanic acids. 3,714,150, Cl. 260-239.100.

Selwitz, Charles M.: *See—*
Notaro, Vincent A.; and Selwitz, Charles M., 3,714,277.

Senderoff, Seymour: *See—*
Mellors, Geoffrey W.; and Senderoff, Seymour, 3,713,993.

Senft, Frank W.: *See—*
Schenck, Robert L.; Schenck, George E.; and Senft, Frank W., 3,713,317.

Senk, Paul: *See—*
Vahle, Erwin; and Senk, Paul, 3,713,605.

Senrui, Shiro: *See—*
Takehisa, Masaaki; and Senrui, Shiro, 3,714,008.

Serebryakova, Tatyana Andreevna: *See—*
Zakharychev, Ardalion Vladimirovich; Serebryakova, Tatyana Andreevna; Ananchenko, Sopia Nikolaevna; and Torgov, Igor Vladimirovich, 3,714,235.

Servo Corporation of America: *See—*
Kreda, Eugene J., 3,714,441.

Servo Corporation of America, mesne: *See—*
Macey, Frank G., 3,714,602.

Severijns, Adrianus Petrus: *See—*
Staas, Frans Adrianus; and Severijns, Adrianus Petrus, 3,713,305.

Shaler, Amos J.; and Mc Lean, Daniel C. Systems for the removal of pollutants from water. 3,713,542, Cl. 210-170.000.

Shansey, John W., to Olin Corporation. Safety container for explosive powder. 3,713,360, Cl. 86-1.000.

Shapiro, Leonard, to Sun Chemical Corporation. Phthalocyanine pigments. 3,713,857, Cl. 106-288.00q.

Shapiro, Stephen, to Becton, Dickinson and Company. Apparatus for chemical testing. 3,713,780, Cl. 23-259.000.

Sharp, James H., to Xerox Corporation. Inhibitor device. 3,713,861, Cl. 117-15.000.

Sharpe, Cecil H., to General Motors Corporation. Liquid fuel spray nozzles with air atomization. 3,713,588, Cl. 239-400.000.

Shartrand, Allan C.: *See—*
De Mania, Dominio; Shartrand, Allan C.; and Barton, Sterling C., 3,714,478.

Shattles, Henry S.: *See—*
Abromavage, John C.; and Shattles, Henry S., 3,713,662.

Shattuck, Meredith D.: *See—*
Champ, Robert B.; Cherry, Albert J.; and Shattuck, Meredith D., 3,713,820.

Shavel, John, Jr.: *See—*
Zinnes, Harold; Lindo, Neil A.; and Shavel, John, Jr., 3,714,155.

Shaw, Joseph Michael, to RCA Corporation. Semiconductor device or monolithic integrated circuit with tungsten interconnections. 3,714,521, Cl. 317-234.00r.

Shaw, Richard Horace, to United Aircraft Corporation. Electrode for electrochemical drilling. 3,714,018, Cl. 204-284.000.

Shaw, Robert B., to Shell Oil Company. Cold extrusion process. 3,714,320, Cl. 264-323.000.

Shaw, Robert R.; and Robinson, Charles C., to American Optical Corporation. Neodymium glass laser having room temperature output at wavelengths shorter than 1060 NM. 3,714,059, Cl. 252-301.40f.

Sheehan, Leo J., III, to Western Electric Company, Incorporated. Methods and apparatus for locating solder fault. 3,713,741, Cl. 356-165.000.

Shekhter, Semen Yakovlevich: *See—*

Nautny, Konstantin Trofimovich; Lakomsky, Viktor Iosifovich; Chvertko, Anatoly Ivanovich; Shekhter, Semen Yakovlevich; Reznitsky, Alexandr Mikhailovich; and Pilipchuk, Viktor Romanovich, 3,714,368.

Shell Oil Company: *See—*
Berry, Thomas E., 3,714,029.
Shaw, Robert B., 3,714,320.
Van Der Toorn, Lambertus J.; Ouwerkerk, Jacobus S. M.; and Van Klinken, Jakob, 3,714,031.
Vondrak, Mary Frances, 3,714,070.

Shephard, Kenneth P., to Upjohn Company, The. Process for making 7-halolincomycins. 3,714,141, Cl. 260-210.00r.

Shermazanian, Yakov Tigranovich: *See—*
Markosian, Marlen Mamukovich; Shermazanian, Yakov Tigranovich; Kazanxhian, Grigory Paravonovich; Avakian, Jury Vardkesovich; and Vartanian, Albert Vartanovich, 3,713,727.

Shiba, Keisuke; Hinata, Masanao; and Sawahara, Masao, to Fuji Photo Film Co., Ltd. Solarization type silver halide emulsion containing a halogenated hydroxyphthalein sensitizing dye and a desensitizing compound. 3,713,832, Cl. 96-101.000.

Shigezane, Suzu; Naoi, Fusaji; Saito, Seiichi; Kojima, Michio; and Ishida, Ryuichi, to Tanabe Seiyaku Co., Ltd. Certain-1-aryl-3-substituted benzamido-2-pyrrolidinones. 3,714,175, Cl. 260-295.0am.

Shima, Takeo; Urasaki, Takanori; and Oka, Isao, to Teijin Limited. Aromatic ortho-carbamater added to polyester polycondensation. 3,714,125, Cl. 260-75.00m.

Shimamoto, Susumu: *See—*
Nomura, Harehiko; and Shimamoto, Susumu, 3,714,371.

Shimer, Daniel W.; and Salihi, Jalal T., to General Motors Corporation. Vehicle electric drive providing regulation of drive wheel operating speed difference. 3,713,504, Cl. 180-65.00r.

Shipowners Refrigerated Cargo Research Association: *See—*
Pearson, Kenneth White, 3,713,623.

Shiratory, Yoshitaka; and Kaneko, Hirokazu, to Ricoh Co., Ltd. Shutter for cameras. 3,713,374, Cl. 95-59.000.

Shirland, Fred A., to Gould Inc., mesne. Integrated solar cell array. 3,713,893, Cl. 136-89.000.

Shoemaker, Robert H.; and Faler, John A., to Kolene Corporation. Aluminum shield for a roll in continuous strip apparatus. 3,714,016, Cl. 204-211.000.

Shore, Sidney X., to Souvenir Pen and Pencil Company. Retractable measuring tape. 3,713,603, Cl. 242-107.200.

Shroff, James R.: *See—*
Bandurco, Victor; and Shroff, James R., 3,714,182.

Shterman, Semen Abramovich: *See—*
Tobak, Lev Zeilikovich; Shterman, Semen Abramovich; Brandenburgsky, Mikhail Galileevich; Lichman, Nikolai Iosifovich; and Lugovskoi, Andrei Lukyanovich, 3,713,198.

Shugart, Michael E. Air operated ultrasonic transducer. 3,713,417, Cl. 116-137.00a.

Shults, Wilbur D.; and Kuempel, John R., to United States of America, Atomic Energy Commission. Electrochemical air pollution monitoring device and method of use thereof. 3,713,994, Cl. 204-1.00t.

Sickinger, Hans, Company: *See—*
Pfaffle, Ernst, 3,713,420.

Siedler, Arthur J.: *See—*
Burrous, Stanley E.; Eudy, William W.; and Siedler, Arthur J., 3,714,356.

Siemens Aktiengesellschaft: *See—*
Stark, Gustav; Otto, Klaus; and Geissler, Rolf, 3,714,017.
Weber, Ulrich, 3,714,424.
Wolfle, Rudolf; Rucker, Dieter; and Lauerer, Uta, 3,713,913.

Siemens-Electrogerate GmbH: *See—*
Detterbeck, Heinrich, 3,713,719.

Silver, Wallace E.: *See—*
Johnson, Clifford T.; Neuhaus, Herbert M.; Silver, Wallace E.; Whiting, Gordon D.; and Larson, Richard A. N., 3,713,361.

Simms, R. John, to Agricultural Control Systems. Forward scatter optical turbidimeter apparatus. 3,713,743, Cl. 356-208.000.

Simon, Michael, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Combustion chamber and nozzle arrangement for a rocket engine. 3,713,293, Cl. 60-267.000.

Simonton, Robert D., to Dale Products, Inc. Method and apparatus for feeding strip material. 3,713,571, Cl. 226-2.000.

Simplex Specialty Co., Inc.: *See—*
Van Kempen, Charles; and Zamek, Paul, 3,713,649.

Sims, Clarence R. Combination cleaner, polisher and waxing device for walls and floors. 3,713,744, Cl. 401-9.000.

Singer Company, The: *See—*
Ciecior, Heinrich, 3,713,407.
Clowers, Earl R.; and Azelkas, Walter G., 3,713,185.
Futter, Menachem, 3,713,406.
Vahle, Erwin; and Senk, Paul, 3,713,605.
Wilber, Thomas W., 3,713,735.

Singh, Digjit, to Bell & Howell Company, mesne. Methods and apparatus for FM demodulation using non-linear amplifying and/or feedback paths. 3,714,596, Cl. 329-192.000.

Singletary, William R.: *See—*
Kelley, Fred W., Jr.; Mishkovsky, Victor; and Singletary, William R., 3,714,544.

Sinkovitz, Gloria DiMarco: *See—*
Hoover, Erwin Frederick; and Sinkovitz, Gloria DiMarco, 3,713,859.

Sipos, Frank, to Squibb, E. R., & Sons, Inc. Peptide synthesis. 3,714,140, Cl. 260-112.500.

Sirago, James J.; and Walton, Edward B. Disposable comparison detector kit. 3,713,779, Cl. 23-259.000.

Sivertson, Wilford E., Jr., to United States of America, National Aeronautics and Space Administration. Rate data encoder. 3,714,645, Cl. 340-347.0ad.

Skinner, Derick Charles, to Lever Brothers Company. Protective packs. 3,713,577, Cl. 229-33.000.

Skobel, Max, to Dow Corning Corporation. Multiple component metering and mixing device. 3,713,627, Cl. 259-6.000.

Skooglund, Carl M., Jr., to Texas Instruments, Incorporated. Metal oxide deposition system. 3,713,419, Cl. 118-47.000.

Skrutzitis, Karl Ernestovich: *See—*
Apsit, Voldemar Voldemarovich; Kokle, Juris Leovich; Skrutzitis, Karl Ernestovich; and Schukin, Mikhail Ivanovich, 3,714,480.

Sladkov, Alexandr Stepanovich, to Gornometallurgichesky Institut Kolskogo Filliala Akademii Nauk USSR. Device for wet disintegration. 3,713,597, Cl. 241-134.000.

Slater, Robert W., to Atara Corporation. Method and apparatus for stabilizing accumulations in aerated lagoons. 3,714,036, Cl. 210-8.000.

Sloan, James, to Cross River Products, Inc. Child carrier. 3,713,568, Cl. 224-6.000.

Sloan, Robert E.: *See—*
Dare, Sherman E.; Haas, Davey S.; Herold, Stanley J.; Norris, Steven R.; Patterson, Terry V.; and Sloan, Robert E., 3,713,394.

Slodki, Morey E.; Smiley, Millie Jo; and Hensley, Dwight E., to United States of America, Agriculture. Production of mannans by fermentation. 3,713,979, Cl. 195-31.00p.

Sloger, Thomas L. Vehicle electrical locking and alarm system. 3,714,628, Cl. 340-64.000.

Slusarczyk, William: *See—*
Almasi, Gabriel Charles; and Slusarczyk, William, 3,714,037.

Slysh, Paul; and Hujsak, Edward J., to General Dynamics Corporation. Spaced wall container. 3,713,560, Cl. 220-15.000.

Smatko, Joseph S.: *See—*
Strier, Murray P.; and Smatko, Joseph S., 3,713,890.

Smeulers, Wouter: *See—*
Hovens, Paulus Joseph Maria; and Smeulers, Wouter, 3,714,454.

Smiley, Millie Jo: *See—*
Slodki, Morey E.; Smiley, Millie Jo; and Hensley, Dwight E., 3,713,979.

Smith, Clarence G., to Mobil Oil Corporation. Timing number generator. 3,714,663, Cl. 346-23.000.

Smith, Curtis P.; and Ulrich, Henri, to Upjohn Company, The. Process for the production of 1-halo-3-methyl and 1-halo-3,4-dimethyl phospholenes. 3,714,246, Cl. 260-543.00p.

Smith, David R.; and Peterson, Howard, to Staley, A. E., Manufacturing Company. Vinylidene chloride copolymer. 3,714,106, Cl. 260-29.6ta.

Smith, Harry A.: *See—*
Kobel, Erwin H.; and Smith, Harry A., 3,714,121.

Smith, James Lanson: *See—*
Kish, Donald Eugene; and Smith, James Lanson, 3,714,639.

Smith, Johanna Wilhelmina V. O., to Scott Paper Company, The. High solids coating composition. 3,714,107, Cl. 260-29.700.

Smith Kline & French Laboratories: *See—*
Sutton, Blaine M., 3,714,173.

Smith Kline and French Laboratories Limited: *See—*
Hills, Derek William; and Sach, George Sidney, 3,714,224.

Smith, Lester C.: *See—*
Rosen, Alfred H.; and Smith, Lester C., 3,714,372.

Smith, Lowell R., to Monsanto Company. Deodorization of phosphorodithioates. 3,714,303, Cl. 260-989.000.

Smith, Norman F.; and Stocker, Edward T., to Western Electric Company, Incorporated. Apparatus for distributing a strand. 3,713,599, Cl. 242-7.110.

Smith, Reginald A.: *See—*
Arnett, Hager F.; and Smith, Reginald A., 3,713,377.

Smith, Thomas S.: *See—*
Stout, Lilburn G., Jr.; Butler, Robert F.; and Smith, Thomas S., 3,713,391.

Smithgall, Harry E.: *See—*
Johnson, Alfred D.; Say, Donald L.; and Smithgall, Harry E., 3,714,489.

Smolka, Thomas Gordon; and Zelinka, Johann, to Wiener Metallwarenfabrik Smolka & Co. Spring locking device. 3,713,664, Cl. 280-11.35t.

Snam Progetti S.p.A.: *See—*
Dolci, Gioacchino,; and Renzoni, Ruggero, 3,714,323.

Snap-On Tools Corporation: *See—*
Knudsen, Raymond G., 3,713,356.

Sobel, Alan, to Zenith Radio Corporation. Image-display panel with breakdown-switch addressing. 3,714,374, Cl. 178-7.30d.

Societa' Italiana Resine S.p.A.: *See—*
Mancini, Corrado; and Gaspari, Raffaele, 3,714,123.

Societa' Italina Resine S.p.A.: *See—*
Calcagno, Benedetto; Divo, Claudio; and Ghirga, Marcello, 3,714,237.

Societe Anonyme Automobiles Citroen: *See—*
Cadiou, Jean Georges, 3,713,693.

Societe Anonyme dite: L'Oreal: *See—*

Charle, Roger; Kalopissis, Gregoire; and Zviak, Charles, 3,714,049.

Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine: *See—*
Desgrandchamps, Guy; Hemmer, Henri; and Haurie, Michel, 3,714,286.

Societe Anonyme: Ugine Kuhlmann: *See—*
Gittenait, Marcel, 3,713,802.

Societe Chimique des Charbonnages: *See—*
Mottez, Paul; and Lejeune, Regis, 3,714,053.

Societe de Recherches Industrielles S.O.R.I.: *See—*
Majoie, Bernard, 3,714,197.

Societe des Accumulateurs Fixes et de Traction, Societe Anonyme: *See—*
Lecouffe, Yves Jacques Felix, 3,713,889.

Societe d'Etudes et de Developpement des Aeroglisseurs Marins Terrestres et Amphibies S.E.-D.A.M.: *See—*
Bertin, Jean Henri; Berthelot, Maurice Paul; and Delamare, Guy Robert, 3,713,507.

Societe d'Exploitation des Brevets Neiman: *See—*
Lipschutz, Paul, 3,713,506.

Societe Generale de Recherches d'Applications Scientifiques "-Sogeras": *See—*
Claude, Gueremy; Robert, Labey; and Roger, Thevenot, 3,714,357.

Societe Hispano-Suiza/Lallemant: *See—*
Leclerco, Jacques; and Reide, Louis, 3,713,608.

Societe Industrielle Bull-General Electric (Societe Anonyme): *See—*
Jallais, Francois Denis, 3,714,447.

Societe Industrielle Honeywell Bull: *See—*
Betremieux, Pierre Arthur; Feissel, Henri Gerard; Gallard, Jean Hilaire; and Lagadec, Isidore, 3,713,885.

Societe Nationale d'Etudes et de Construction de Moteurs d'Aviation: *See—*
Galmiche, Philippe M.; Pelissier, Jean H.; and Spinat, Roland R., 3,713,206.

Societe Nationale Industrielle Aerospatiale: *See—*
Lavarenne, Jean, 3,714,642.

Sodergard, Bengt: *See—*
Van Santen, Aart; and Sodergard, Bengt, 3,713,971.

Sokolowski, Robert C., to Kimberly-Clark Corporation. Method for producing non-woven webs. 3,713,933, Cl. 156-176.000.

Somekh, George S., to Union Carbide Corporation. Motive fluids for external combustion engines. 3,713,289, Cl. 60-36.000.

Somekh, George S.; Kubek, Daniel J.; and Kosseim, Alexander J., to Union Carbide Corporation. Process for the separation of aromatic hydrocarbons from a mixed hydrocarbon feedstock. 3,714,033, Cl. 208-321.000.

Somekh, George Solomon: *See—*
Kosseim, Alexander Jean-Marie; Kubek, Daniel John; and Somekh, George Solomon, 3,714,034.

Someno, Kenji: *See—*
Kuniyasu, Yoshihiro; Matsumoto, Akio; Isobe, Eiji; and Someno, Kenji, 3,713,477.

Someya, Teruo; and Sakural, Shigekata. Reflecting mirror type electron microscope. 3,714,425, Cl. 250-49.50a.

Sommer, G. M., Co., Inc.: *See—*
Sommer, Gordon M., 3,713,517.

Sommer, Gordon M., to Sommer, G. M., Co., Inc. Clutch-brake with liquid and air cooling. 3,713,517, Cl. 192-18.00a.

Soriano, Rene: *See—*
Goldfarb, Adolph E.; and Soriano, Rene, 3,713,655.

Sosin, Frank H.; and Cintron, Rene. Combined lock and alarm. 3,714,643, Cl. 340-274.000.

Southwick, Samuel G. Method and apparatus for titrating liquids. 3,713,774, Cl. 23-253.00r.

Souvenir Pen and Pencil Company: *See—*
Shore, Sidney X., 3,713,603.

Sowinski, Francis A.: *See—*
Yale, Harry L.; and Sowinski, Francis A., 3,714,192.

Spacht, Ronald B., to Goodyear Tire and Rubber Company, The. Alkylation product of 4(methylthio) phenol. 3,714,264, Cl. 260-609.00f.

Spain, Roy C.: *See—*
Oliver, Roy N.; and Spain, Roy C., 3,713,311.

Sparr, Anders V., Sr. Udder and teat cleansing apparatus and sanitizer. 3,713,423, Cl. 119-1.000.

Spearhead, Inc.: *See—*
Hardway, Edward V., Jr., 3,713,436.

Spectrospin AG: *See—*
Keller, Toni, 3,714,553.

Speer, Lawrence, to Vyna-Chem, Inc. Method for patching materials. 3,713,926, Cl. 156-98.000.

Spence, John R., to North American Rockwell Corporation. Clamp circuit for bootstrap field effect transistor. 3,714,466, Cl. 307-237.000.

Spencer, Dana E.: *See—*
Helms, Horace H.; Rozner, Alexander G.; and Spencer, Dana E., 3,713,636.

Sperling, Robert. Trigger safety device. 3,713,239, Cl. 42-1.00y.

Spero, George B.: *See—*
Lincoln, Frank H.; Schneider, William P.; and Spero, George B., 3,714,353.

Sperry Rand Corporation: *See—*
Chen, Nai-Keung; and Omohundro, William A., 3,713,455.
Grace, Martin I.; Kroger, Harry; and Pratt, Harold J., Jr., 3,714,605.
Meranda, James I., 3,714,656.
Ross, Gerald F.; and Susman, Leon, 3,714,655.
Sadler, Loren G., 3,713,471.

Sperry Rand Corporation Ford Instrument Company: *See—*
Segerdahl, Roy R.; and Erb, Theodor, 3,713,343.

Spetsialnoe Proektno-Konstruktorskoi i Tekhnilogicheskoe Bjuro Po Elektrobureniju (SKTBE): *See—*
Chepelev, Viktor Gavrilovich; Grinchenko, Nikolai Nikolaevich; and Goldshein, Jury Moiseevich Goldshein, 3,714,455.

Spika, Wolfram, to Bobst Champlain, Inc. Conveyor for cards and the like. 3,713,648, Cl. 271-79.000.

Spikes, Roger Hugh: *See—*
Hill, Joseph Henry; Kelling, Geoffrey Philip; and Spikes, Roger Hugh, 3,713,714.

Spinat, Roland R.: *See—*
Galmiche, Philippe M.; Pelissier, Jean H.; and Spinat, Roland R., 3,713,206.

Spivack, John D., to Ciba-Geigy Corporation. Bis-(hindered phenol)-alkylene diphosphonates and phosphonoacetates. 3,714,300, Cl. 260-932.000.

Spohr, Albert R.: *See—*
Waters, Robert S.; and Spohr, Albert R., 3,714,411.

Spradlin, Louis W., to General Electric Company. Computer controlled rolling mill. 3,713,313, Cl. 72-8.000.

Sprague Electric Company: *See—*
Vail, Atlee G., 3,714,528.

Sprague, Robert A.: *See—*
Ruckle, Duane L.; and Sprague, Robert A., 3,713,207.

Sprigings, Howard Charles: *See—*
McIntyre, Robert John; and Sprigings, Howard Charles, 3,714,491.

Springer, Earl W. Altitude alerting system. 3,713,340, Cl. 73-384.000.

Spruce, Brian: *See—*
Coast, Geoffrey; Prince, Kenneth; Spruce, Brian; and Morgan, Vernon, 3,713,972.

Square D Company: *See—*
Bernier, Chester A., 3,714,387.
Leonard, James H.; and Quick, Richard C., 3,714,383.

Squibb, E. R., & Sons, Inc.: *See—*
Haugwitz, Rudiger D.; and Narayanan, Venkatachala Lakeshmi, 3,714,180.
Sipos, Frank, 3,714,140.
Yale, Harry L.; and Sowinski, Francis A., 3,714,192.
Yale, Harry L., 3,714,221.
Yale, Harry Louis; and Pluscec, Jelka, 3,714,172.
Yale, Harry Louis; and Petigara, Ramesh B., 3,714,201.

Staas, Frans Adrianus; and Severijns, Adrianus Petrus, to U.S. Philips Corporation. Device for producing cold at temperature lower than that of λ-point of helium. 3,713,305, Cl. 62-500.000.

Stabler, Edward P.: *See—*
McAfee, John G.; Mozley, James M.; and Stabler, Edward P., 3,714,429.

Staiger, William C., to General Electric Company. Resilient axle lining dust guard. 3,713,709, Cl. 308-36.100.

Stal Refrigeration AB: *See—*
Nilsson, Nils Edvin Folke; and Eurenius, Jimmie Arne, 3,713,303.

Staley, A. E., Manufacturing Company: *See—*
Hayes, Lester P.; Jones, Rexford W.; and Thompson, William B., 3,713,831.
Smith, David R.; and Peterson, Howard, 3,714,106.

Stam, John G., to Pfizer Inc. Bronchodilator activity of substituted quinazolinecarboxylic acid esters. 3,714,354, Cl. 424-251.000.

Stambler, Leon. Gravity feed card transports and readers. 3,714,396, Cl. 235-61.11c.

Standard Oil Company: *See—*
Bertolacini, Ralph J.; and Radford, Herschel D., 3,714,032.

Stanford Research Institute: *See—*
Coon, Clifford L.; and Hill, Marion E., 3,714,272.

Stange, Hugo, to FMC Corporation. Glycidyl acetate as viscosity modifier for liquid epoxy resins. 3,714,112, Cl. 260-30.4ep.

Stapp, Paul R., to Phillips Petroleum Company. Catalytic alkylation of aromatic compounds. 3,714,280, Cl. 260-668.00c.

Starck, Axel Von; and Schnake, Friedrich, to AEG-Elotherm GmbH. Melting or holding vessel for liquid metals with an adjoining electromagnetic conveying trough. 3,713,639, Cl. 266-38.000.

Stark, Gustav; Otto, Klaus; and Geissler, Rolf, to Siemens Aktiengesellschaft. Electrode device for electrochemically forming the plates of turbine rotors. 3,714,017, Cl. 204-284.000.

Stauffer Chemical Company: *See—*
Baker, Don R.; and Teach, Eugene G., 3,714,219.
Gaughan, Edmund J., 3,714,176.
Jordan, Robert L.; Wilson, Norman E.; and Goldman, Thomas M., 3,714,040.

Stauffer-Wacker Silicone Corporation: *See—*
Lengnick, Guenther Fritz, 3,714,212.

Stearns, Edwin Ira, to American Cyanamid Company. Evaluation of matches in computer color matching. 3,714,667, Cl. 444-1.000.

Stece-AB Industrifjadran: *See—*
Wallin, Jan-Olof Raymond, 3,713,192.

Steele, Eugene K.: *See—*
Charewicz, Francis J.; Steele, Eugene K.; and Nichols, Frank S., 3,714,318.

Stefanka, Joseph Anthony, to Norbalt Rubber Corporation. Method for forming convoluted tubing. 3,714,311, Cl. 264-98.000.

Steffan, Guido, to Farbenfabriken Bayer Aktiengesellschaft. Process for the manufacture of tetrachloropyrimidine. 3,714,164, Cl. 260-251.00r.

Steger, Donald J.: *See—*
Forrest, James S.; Litkenhus, John R.; and Steger, Donald J., 3,713,524.

Stehle, Peter Fallon; Wu, Chan K.; Loshaek, Samuel; and Dickstein, Jack, to Borden Inc. Adhesive latexes of vinyl acetate/ethylene/N-methylolacrylamide terpolymers. 3,714,105, Cl. 260-29.6wa.

Stein Industries: *See—*
Maille, Claude, 3,713,403.

Stein, Maria: *See—*
Luthman, Paul A.; Stein, Maria; and Fischer, Thomas R., 3,713,661.

Steinbeck, Hermann: *See—*
Hofmeister, Helmut; Steinbeck, Hermann; and Wiechert, Rudolf, 3,714,207.

Steizer, James G.: *See—*
Dickensheets, Carlton O.; and Steizer, James G., 3,713,563.

Stenger, Hanns G. Adaptor for tape transport truck and the like. 3,713,716, Cl. 312-107.000.

Stephans, J. Larry. Lamp assembly. 3,714,418, Cl. 240-67.000.

Stephensen, Allan P., to Appleton Electric Company. Directional mounting for area lighting. 3,714,415, Cl. 240-44.260.

Sterk, Andrew A., to General Electric Company. Solar flare warning device. 3,714,431, Cl. 250-83.30r.

Sterling Drug Inc.: *See—*
Archer, Sydney; and Rosi, David, 3,714,167.

Sternberg, George P. Dough making method. 3,713,844, Cl. 99-91.000.

Sternius, Alf Tommy, to Kommandilbolaget T. Sternius Aktiebolag & Co. Ornamental lighting means. 3,714,414, Cl. 240-10.00r.

Stewart, Harold E.: *See—*
Derner, William J.; Stewart, Harold E.; Root, Lawrence E.; and Goodelle, Roger A., 3,713,712.

Stewart-Warner Corporation: *See—*
Brouwer, Frans; Englehardt, William H.; Krempel, Frank M.; and Payne, Robert A., 3,714,649.
Cartwright, Robert S., 3,713,186.

Stilley, George W.; Wagner, William E.; and Kelly, Joseph D., to PPG Industries, Inc. Method of press shaping glass sheets. 3,713,798, Cl. 65-106.000.

Stimson, Ronald M., to Eastman Kodak Company. Magnetic recording member with binder therefor. 3,713,887, Cl. 117-235.000.

Stine, Laurence O., to Universal Oil Products Company. High octane gasoline production. 3,714,022, Cl. 208-62.000.

Stine, Laurence O., to Universal Oil Products Company. High octane gasoline production. 3,714,023, Cl. 208-62.000.

Stock, Richard R. Self-cleaning restroom. 3,713,176, Cl. 4-1.000.

Stocker, Edward T.: *See—*
Smith, Norman F.; and Stocker, Edward T., 3,713,599.

Stoe & Cie, GmbH: *See—*
Wolfel, Erich R.; and Wendel, Richard H., 3,714,426.

Stokbroekx, Raymond Antoine: *See—*
Janssen, Paul Adriaan Jan; Niemegeers, Carlos Jan Ernest Josef; Stokbroekx, Raymond Antoine; and Vandenberk, Jan, 3,714,159.

Stolarz, Edward M.: *See—*
D'Elia, Anthony N.; and Stolarz, Edward M., 3,713,452.

Stone & Webster Engineering Corporation: *See—*
Kennedy, William J. L.; Miczek, Charles B.; and Garabedian, George, 3,713,968.

Stone, Irving Charles: *See—*
Triggiani, Leonard Vincent; and Stone, Irving Charles, 3,714,061.

Stork Amsterdam N.V.: *See—*
Anselrode, Lodewijk; and Anthonis, Sint, 3,713,997.

Storkebaum, Christoph: *See—*
Dorschner, Oskar; Storkebaum, Christoph; Carduck, Franz Josef; and Janfeld, Johannes, 3,713,590.

Story, Anne W., to United States of America, National Aeronautics and Space Administration. Display system. 3,714,624, Cl. 340-27.00r.

Stout, Lilburn G., Jr.; Butler, Robert F.; and Smith, Thomas S., to United States of America, Navy. Electronic ignition delay for 5""/38 and 5""/54 rocket assisted projectiles. 3,713,391, Cl. 102-70.20a.

Stover, Harris A., to Collins Radio Company. Secondary phase modulated communications service via AM broadcast stations. 3,714,375, Cl. 179-2.00e.

Stracek, Robert J., to Chemetron Corporation. Electrical grounding system. 3,714,517, Cl. 317-123.000.

Stretanski, Joseph Anthony, to American Cyanamid Company. Melamines as light stabilizers in titanium dioxide pigmented polymers. 3,714,114, Cl. 260-41.00b.

Strier, Murray P.; and Smatko, Joseph S., to McDonnell Douglas Corporation. Flexible battery separator and method of production. 3,713,890, Cl. 136-20.000.

Strnad, Emil. Oxy-acetylene cutting torch-holder and guide. 3,713,635, Cl. 266-23.0hh.

Stroman, Larry J., to Daniel Industries, Inc. Apparatus and method for automatic differential pressure transducer range changing. 3,713,337, Cl. 73-205.00r.

Strycker, Stanley J., to Dow Chemical Company, The. Phenoxaphosphinic acid derivatives. 3,714,160, Cl. 260-247.70c.

Stupak, Leonid Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Baglai, Vitaly Mikhailovich; and Alferov, Jury Fedorovich, 3,713,476.

Sturm, Elmar; and Vogel, Christian, to Ciba-Geigy Corporation. Bicyclo[n.1.O]N'-alkyl-N'-alkoxy ureas as herbicides. 3,714,217, Cl. 260-453.00r.

Sturm, Hans Juergen; and Armbrust, Herbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of O-benzoylbenzoic acid. 3,714,240, Cl. 260-517.000.

Suda, Tetsuo: *See—*
Yoshida, Shoushi; Iwama, Atsuaki; Odada, Takashi; and Suda, Tetsuo, 3,714,321.

Suddeutsche Kalkstickstoff-Werke AG: *See—*
Lienhard, Klaus; and Ulmschneider, Dieter, 3,714,137.

Sugino, Toshiyuki: *See—*
Fujiwara, Ryozo; Ohaha, Eiji; Maeda, Kazuo; Terada, Fumio; Sugino, Toshiyuki; Arakane, Hiroyasu; and Watanabe, Yoshimoto, 3,714,340.

Suh, John T., to Colgate-Palmolive Company. Derivatives of 1,2,3,4-tetrahydro-5 (H-benzothieno [2,3-C] azepines. 3,714,193, Cl. 260-330.500.

Sumitomo Chemical Co., Ltd.: *See—*
Okamoto, Tadashi; Kobayashi, Tsuyoshi; and Yamamoto, Hisao, 3,714,148.

Sumitomo Chemical Company Limited: *See—*
Ohrui, Tetsuya; Sakakibara, Yasuhito; and Tanaka, Junji, 3,714,333.

Sumitomo Chemical Company, Ltd.: *See—*
Ito, Ken; Kaminaka, Hiroshi; and Oie, Kunihisa, 3,714,269.
Kaminaka, Hiroshi; Tamura, Takashi; and Tanimoto, Kenji, 3,714,268.

Sun Chemical Corporation: *See—*
Shapiro, Leonard, 3,713,857.

Sun Oil Company: *See—*
Norton, Richard V., 3,714,249.

Sun Oil Company (Delaware): *See—*
Bennett, John, 3,713,707.

Sunbeam Corporation: *See—*
Waters, Robert S.; and Spohr, Albert R., 3,714,411.

Sundstrand Corporation: *See—*
Pollman, Frederic W.; Frandsen, Lee R.; and Throckmorton, Charles D., Sr., 3,713,759.

Surface Technology Corporation: *See—*
Van Thyne, Ray J.; and Rausch, John J., 3,713,906.
Van Thyne, Ray J.; and Rausch, John J., 3,713,907.

Surgical Appliance Industries, Inc.: *See—*
Williams, Marguerite R., 3,713,450.

Surko, Walter E., Jr., to Emhart Corporation. Lock cylinder. 3,713,310, Cl. 70-364.00a.

Survival Technology, Inc.: *See—*
Sarnoff, Stanley J., 3,713,446.

Susman, Leon: *See—*
Ross, Gerald F.; and Susman, Leon, 3,714,655.

Suszer, Adalbert, to United States of America, Interior. Preparation of anion exchange membranes from cellulosic sheets. 3,714,010, Cl. 204-180.00p.

Sutton, Blaine M., to Smith Kline & French Laboratories. Pyridyl ketipate lactones and derivatives. 3,714,173, Cl. 260-295.00r.

Sutton, Robert G., to Norwood Industries, Inc. Production of polyurethane film/split leather laminate. 3,713,938, Cl. 156-246.000.

Suzuki, Clarence K., to Hughes Aircraft Company. Method for making uniform single crystal semiconductors epitaxially. 3,713,900, Cl. 148-1.500.

Suzuki, Fumio: *See—*
Baba, Takesi; Osada,Koichi; Hokawa, Takuya; and Suzuki, Fumio, 3,714,574.

Suzuki, Hidenori; Iizaka, Isao; Horie, Yoshihiro; Maeda, Katsumi; and Inagaki, Shotaro, to Minolta Camera Kabushiki Kaisha. Reader-printer for electrographs. 3,713,737, Cl. 355-45.000.

Svensson, Einar. Building structure. 3,713,258, Cl. 52-90.000.

Swanepoel, Lourens Petrus, to Anglo American Corporation of South Africa Limited. Magnetic sensor for detecting breaks in a steel rope including multiplier for eliminating noise. 3,714,558, Cl. 324-37.000.

Sweeney, John W. Time delay switching system with improved twenty-four hour controller. 3,714,457, Cl. 307-141.000.

Swenson, Thomas C.: *See—*
Pour-El, Akiva; and Swenson, Thomas C., 3,713,843.

Swett, James B.: *See—*
Daenen, Robert; and Swett, James B., 3,713,528.

Swinea, Jessie D., Jr. Solid state timer. 3,714,519, Cl. 317-141.00s.

Sykes Datatronics, Inc.: *See—*
Sykes, John R., 3,714,382.

Sykes, Donald J.; Kroll, Harry; and Finch, Theron R., to Hunt, Philip A., Chemical Corporation. Sulfite esters as preservatives for black and white developing agents. 3,713,826, Cl. 96-66.400.

Sykes, John R., to Sykes Datatronics, Inc. Method and system for bidirectional search and positioning magnetic recording tape using a reel turn sensor controlled coarse positioning. 3,714,382, Cl. 179-100.20s.

Sylvania Electric Products, Inc.: *See—*
Macey, Frank G.; and Reif, Robert H., 3,714,397.
Symbionics, Inc.: *See—*
Craig, Dwin R., 3,713,720.
Symon, Ted, to Universal Oil Products Company. Dimerization of olefinic compounds. 3,714,284, Cl. 260-677.00r.
Symons, Philip C., to Oxy Metal Finishing Corporation. Process for electrical energy using solid halogen hydrates. 3,713,888, Cl. 136-6.000.
Szklarz, Eugene G.: *See—*
Giorgi, Angelo L.; and Szklarz, Eugene G., 3,713,898.
Szmuszkovicz, Jacob; and Cerda, Elisabeth S., to Upjohn Company, The. 7-(1-pyrrolidinyl)-endo-7-norcaranol and its method of preparation. 3,714,186, Cl. 260-326.50r.
Szpur, Roman, to NDM Corporation, mesne. Pickup electrode with rigid electrolyte cup. 3,713,435, Cl. 128-2.06e.
Tabasso, Giovanni: *See—*
Michellone, Giancarlo; Palazzetti, Mario; and Tabasso, Giovanni, 3,713,705.
Tabata, Toshikazu: *See—*
Kondo, Seigo; Tabata, Toshikazu; and Horiuchi, Jiro, 3,714,166.
Takahashi, Masaaki; Yamauchi, Takashi; Okuda, Kensuke; and Ito, Akira, to Kureha Kagaku Kogyo Kabushiki Kaisha. Thermally stable insulating oil. 3,714,021, Cl. 208-14.000.
Takahashi, Shinkichi, to Canon Kabushiki Kaisha. AC corona discharger. 3,714,531, Cl. 317-262.00a.
Takahashi, Tetsuya: *See—*
Kariya, Shizuo; Narita, Hiroshi; Tuboi, Takashi; and Takahashi, Tetsuya, 3,714,467.
Takamori, Takeshi; and Akanuma, Masanobu, to Nippon Electric Company, Limited. Joined body of pyrolytic graphite and metallic members. 3,713,790, Cl. 29-195.000.
Takamura, Isao: *See—*
Dohmori, Renzo; Kadoya, Shizuo; Takamura, Isao; Oshima, Yasuo; and Naito, Takeo, 3,714,170.
Takehisa, Masaaki; and Senrui, Shiro, to Japan Atomic Energy Research Institute. Inhibitors for aqueous phase, radiation polymerization. 3,714,008, Cl. 204-159.220.
Takeyama, Kojiro; and Onishi, Hajime, to Matsushita Electric Industrial Co., Ltd. Clothes dryer. 3,713,226, Cl. 34-53.000.
Takigawa, Yukio: *See—*
Sato, shozo; Otaka, Yoshihisa; and Takigawa, Yukio, 3,714,343.
Taliaferro, Gerald R.: *See—*
Duff, Billy E.; and Taliaferro, Gerald R., 3,714,610.
Tallent, Othar K., to United States of America, Atomic Energy Commission. Method for preparing stable urania-plutonia sols. 3,714,056, Cl. 252-301.150.
Tamura, Masanori; Fukuda, Muneyuki; and Ogawa, Yoji, to Kabushiki Kaisha Taihei Seisakusho; a/k/a Taihei Machinery Works, Ltd. Method and device for positioning sheet material. 3,713,647, Cl. 271-58.000.
Tamura, Takashi: *See—*
Kaminaka, Hiroshi; Tamura, Takashi; and Tanimoto, Kenji, 3,714,268.
Tanabe Seiyaku Co., Ltd.: *See—*
Shigezane, Suzu; Naoi, Fusaji; Saito, Seiichi; Kojima, Michio; and Ishida, Ryuichi, 3,714,175.
Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshio; Kawanishi, Masazumi; Sato, Masanori; Hoshiyama, Masao; and Nagao, Taku, 3,714,171.
Tanaka, Ikuo: *See—*
Nakanishi, Osamu; and Tanaka, Ikuo, 3,714,132.
Tanaka, Junji: *See—*
Ohrui, Tetsuya; Sakakibara, Yasuhito; and Tanaka, Junji, 3,714,333.
Tanaka, Yoshiaki: *See—*
Matsuda, Kazuo; Tanaka, Yoshiaki; Sakai, Takeyo; and Iwasa, Ichiro, 3,714,266.
Tanck, Frank J., Jr., to Eastman Kodak Company. Apparatus for securing articles to web material. 3,713,955, Cl. 156-552.000.
Tani, Haruhisa: *See—*
Yazawa, Masahide; Tani, Haruhisa; Matsumoti, Masaki; and Sasaki, Yasuo, 3,713,190.
Tanimoto, Kenji: *See—*
Kaminaka, Hiroshi; Tamura, Takashi; and Tanimoto, Kenji, 3,714,268.
Tanzer, John J. Bottle carrier device. 3,713,532, Cl. 206-65.00e.
Tarkan, Stuart E.: *See—*
Prill, Arnold L.; and Tarkan, Stuart E., 3,713,788.
Tarui, Yasuo: *See—*
Komiya, Yoshio; Moll, John L.; and Tarui, Yasuo, 3,714,522.
Tatsunori, Shikada, to Kanegafuchi Boseki Kabushiki Kaisha. Aqueous coagulation of salt containing polyurethane to form porous sheet. 3,714,307, Cl. 264-49.000.
Tavel, Jon H. Method of testing for diabetes. 3,713,772, Cl. 23-230.00b.
Taylor, Billy W.; and Divelbiss, Hubert N. Method for organized assay and bendable test tube rack therefor. 3,713,771, Cl. 23-230.00r.
Taylor, Eustace H. Flashlight holder. 3,713,614, Cl. 248-205.00a.
Teach, Eugene G.: *See—*
Baker, Don R.; and Teach, Eugene G., 3,714,219.
Teijin Limited: *See—*
Shima, Takeo; Urasaki, Takanori; and Oka, Isao, 3,714,125.
Teoli, Anthony. Railway car. 3,713,400, Cl. 105-406.00r.
Terada, Fumio: *See—*
Fujiwara, Ryozo; Ohaha, Eiji; Maeda, Kazuo; Terada, Fumio; Sugino, Toshiyuki; Arakane, Hiroyasu; and Watanabe, Yoshimoto, 3,714,340.
Terai, Masaaki: *See—*
Matsuda, Ryoichi; and Terai, Masaaki, 3,714,381.
Testing Technology Corporation: *See—*
MacGeorge, William D., 3,713,333.
Tetenbaum, Marvin; and Hunt, Paul D., to United States of America, Atomic Energy Commission. Nuclear reactor fuel and fuel element and preparation thereof. 3,714,060, Cl. 252-301.10r.
Tetzner, Siegfried K. Fish hook remover. 3,713,243, Cl. 43-53.500.
Texaco Inc.: *See—*
Franz, William F.; and Hess, Howard V., 3,713,271.
Youngblood, Douglas J.; and Reynolds, David L., 3,714,024.
Texas Instruments, Incorporated: *See—*
Bate, Robert Thomas, 3,714,523.
Bate, Robert Thomas, 3,714,559.
Skooglund, Carl M., Jr., 3,713,419.
Theard, Leslie P.: *See—*
Peterson, Frank C.; and Theard, Leslie P., 3,713,927.
Theissen, Ferdinand: *See—*
Lussling, Theodor; Theissen, Ferdinand; and Wolfgang, Offenbach, 3,714,251.
Thiem Corporation: *See—*
Davidson, Edwin J., 3,713,621.
Thillet, Georges, to B. V. S. Cyclindrical vessel adapted to be subjected to internal pressure. 3,713,559, Cl. 220-3.000.
Thiokol Chemical Corporation: *See—*
Mazzeo, Michael P.; and Santaniello, Anthony F., 3,714,092.
Thomas & Betts Corporation: *See—*
Garner, Peter, 3,713,196.
Thomas, Brian Edward Alston, to Porvair Limited. Recovery of dimenthyl formamide by crystallization and distillation. 3,713,991, Cl. 203-48.000.
Thomas, George I., to Battelle Development Corporation, The, mesne. Method of using an artery-vein shunt applique. 3,713,441, Cl. 128-214.00r.
Thomas, Manuel A., to Deering Milliken Research Corporation. Textile finishing process and product produced thereby. 3,713,878, Cl. 117-135.500.
Thompson, C. Ames; and Cooper, Douglas J. Strainer device for use in drainage receptacles. 3,713,539, Cl. 210-164.000.
Thompson, Larry O.; Gilbert, William J.; Thompson, Louis R.; Martin, James W., Jr.; and Clements, William Lamar, to Petersen Industries, Inc. Container-dumping apparatus. 3,713,554, Cl. 214-147.0hs.
Thompson, Louis R.: *See—*
Thompson, Larry O.; Gilbert, William J.; Thompson, Louis R.; Martin, James W., Jr.; and Clements, William Lamar, 3,713,554.
Thompson, William B.: *See—*
Hayes, Lester P.; Jones, Rexford W.; and Thompson, William B., 3,713,831.
Thomsen, Carl Torben. Device for use in teaching accounting. 3,713,229, Cl. 35-24.00c.
Thomsen, Morten, to A/S Cheminova. Organic thiophosphates of improved odor characteristics and process for their production. 3,714,301, Cl. 260-942.000.
Thomson, Willy; and Carstens, Werner. Advertising-pillar. 3,713,237, Cl. 40-132.00d.
Thor, Robert C.; and Wingrove, Earl R., Jr., to General Electric Company. Radar system. 3,714,653, Cl. 343-17.2pc.
Thorn Automation Limited: *See—*
Tolworthy, Robert Theodore; and Leach, John Harold, 3,714,546.
Throckmorton, Charles D., Sr.: *See—*
Pollman, Frederic W.; Frandsen, Lee R.; and Throckmorton, Charles D., Sr., 3,713,759.
Tidwell, Danny R.: *See—*
Burkhardt, Joseph A.; Childers, Thomas W.; Tidwell, Danny R.; and Koerner, Roger J., 3,714,384.
Tkach, George. Combination anchor and support utilized to secure a mobile home to an underlying foundation. 3,713,259, Cl. 52-111.000.
Tkach, George. Machine supporting slab. 3,713,620, Cl. 248-19.000.
Tkachuk, John. Fish clamping table. 3,713,189, Cl. 17-70.000.
Toagosei Chemical Industry Co., Ltd.: *See—*
Okada, Yoshihiko; and Matsubara, Takashi, 3,714,244.
Tobak, Lev Zeilikovich; Shterman, Semen Abramovich; Brandenburgsky, Mikhail Galileevich; Lichman, Nikolai Iosifovich; and Lugovskoi, Andrei Lukyanovich, to Odessky Zavod Pressov. Double-action hydraulic forcing press. 3,713,198, Cl. 29-208.00c.
Todd, Alexander Henry: *See—*
Mallion, Keith Blakeney; Turner, Ralph William; and Todd, Alexander Henry, 3,714,161.
Tofflemire, Benjamin F. Dental instrument for use with interdental wedges. 3,713,222, Cl. 32-64.000.
Togiya, Akiyoshi; and Kakuda, Satoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of building chimneys. 3,713,195, Cl. 29-155.00c.
Tolworthy, Robert Theodore; and Leach, John Harold, to Thorn Automation Limited. Constant voltage transformers. 3,714,546, Cl. 323-8.000.
Tomic, Ernst A., to Du Pont de Nemours, E. I., and Company. Chemical foaming of water-bearing explosives with N, N'-dinitrosopentamethylenetetramine. 3,713,919, Cl. 149-47.000.
Topol, George J.: *See—*

Carr, Larry R.; and Topol, George J., 3,714,444.
Topouzian, Armen: *See—*
Balje, Otto Erich; Bouchard, Constant L.; Knowles, James; Kosacheff, Dimitri; Pulick, Emil A.; Pulick, Michael A.; and Topouzian, Armen, 3,713,294.
Torelli, Vesperto: *See—*
Nedelec, Lucien; and Torelli, Vesperto, 3,714,203.
Torgov, Igor Vladimirovich: *See—*
Zakharychev, Ardalion Vladimirovich; Serebryakova, Tatyana Andreevna; Ananchenko, Sopia Nikolaevna; and Torgov, Igor Vladimirovich, 3,714,235.
Torii, Tanekatsu, to Nippondenso Kabushiki Kaisha. Method of butt-welding a tubing to a base metal. 3,714,389, Cl. 219-104.000.
Toro Manufacturing Corporation: *See—*
Hunter, Edwin J., 3,713,584.
Torrington Company, The: *See—*
Alling, Richard L.; and Iffland, Roger L., 3,713,713.
Benson, Carl F., 3,713,349.
Toth, Charles; Bailey, Raymond V.; and Harris, Harry G., Jr., to Applied Aluminum Research Corporation. Process for producing aluminum. 3,713,809, Cl. 75-68.00b.
Toth, Charles; and Harris, Harry Gordon, Jr., to Applied Aluminum Research Corporation. Process for producing aluminum. 3,713,811, Cl. 75-68.00r.
Toyo Jozo Co., Ltd.: *See—*
Kitajima, Masao; Kondo, Asaji; and Morishita, Masataka, 3,714,065.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Arai, Hiroshi; and Mori, Takakazu, 3,714,458.
Toyota Jidosha Kogyo Kabushiki Kaisha Nippondenso Kabushiki Kaisha: *See—*
Sakakibara, Shigeru; Kato, Takaaki; and Ito, Katsunori, 3,713,351.
Trame, Charles E., to Everbrite Electric Signs, Inc. Clock. 3,713,286, Cl. 58-53.000.
Tredray, John Hubert. Lifting apparatus. 3,713,556, Cl. 214-621.000.
Triggiani, Leonard Vincent; and Stone, Irving Charles, to Grace, W. R., & Co. Process for preparing impregnated urania and uranium bearing microspheres. 3,714,061, Cl. 252-301.10s.
Triumph Werke Nuernberg A.G.: *See—*
Niemietz, Jurgen P., 3,713,523.
Troing, Ola Peter. Device for composing text portions on a blank sheet in accordance with a lay-out. 3,713,525, Cl. 197-181.200.
Trudeau, Aime. Gravity-actuated self-propelling wheel construction. 3,713,706, Cl. 305-7.000.
Trudeau, Aime. Lamp with combination lamp shade and illuminating mirror. 3,714,409, Cl. 240-4.200.
Trudell, A. R. Chain link fence lift. 3,713,625, Cl. 256-32.000.
TRW Inc.: *See—*
Blumenthal, Jack L.; Ogren, John R.; and Appel, Marvin, 3,713,901.
Koppl, Ernest R.; and Scibbe, Harold R., 3,713,704.
Mc Curry, Morris H., 3,714,532.
Tsuchiyz, Makoto: *See—*
Izumitani, Tetsuro; Asahara, Yoshiyuki; Tsuchiyz, Makoto; and Nagarekawa, Osamu, 3,714,073.
Tsukisaka, Hitoshi. Device for temporarily attaching artificial hair to the scalp. 3,713,454, Cl. 132-9.000.
Tuboi, Takashi: *See—*
Kariya, Shizuo; Narita, Hiroshi; Tuboi, Takashi; and Takahashi, Tetsuya, 3,714,467.
Tufts, Wesley M.; and Albertassi, James H., to Nautron Corporation. Marine toilet. 3,713,177, Cl. 4-95.000.
Tullock, Charles William, to Du Pont de Nemours, E. I., and Company. Fluorine containing adamantanes and bicyclo [2.2.2] octanes. 3,714,273, Cl. 260-648.00f.
Tung, Ching C.; and Powers, Jack F., to Monsanto Company. Isopropylidineaminoethanol salt of p-nitrobenzenesulfonylurea. 3,714,209, Cl. 260-397.700.
Turek, James A.: *See—*
Wallace, Donald G.; and Turek, James A., 3,713,544.
Turnbull, Brian, to Imperial Chemical Industries Limited. Blasting method. 3,713,384, Cl. 102-27.000.
Turner, Ralph William: *See—*
Broadbent, Douglas; Turner, Ralph William; and Walton, Peter Leslie, 3,713,981.
Mallion, Keith Blakeney; Turner, Ralph William; and Todd, Alexander Henry, 3,714,161.
Turner, William J.; Henry, Wayne E.; and Hubb, Gary W., to Griffith Laboratories, Inc., The. Method for cooking meat products. 3,713,846, Cl. 99-107.000.
Tweit, Robert C., to Searle, G. D., & Co. 1-Alkyl-2-furfurylthioimidazoles and congeners. 3,714,179, Cl. 260-309.000.
Uchida, Kosaku, to Matsushita Electric Industrial Co., Ltd. Switching circuit. 3,714,469, Cl. 307-253.000.
Udy, Lex L.: *See—*
Cook, Melvin A.; Clay, Robert B.; and Udy, Lex L., 3,713,917.
Uelzmann, Heinz: *See—*
Fabris, Hubert J.; Maxey, Edwin M.; and Uelzmann, Heinz, 3,714,127.
Uenae, Tadao: *See—*
Maruyama, Takeji; and Uenae, Tadao, 3,713,793.
Ueno, Ryuzr; and Miyazaki, Tetsuya, to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo. Process for the preparation of P-hydroxybenzoic acid ester alkali metal salts. 3,714,227, Cl. 260-473.00s.
Uesugi, Kyozo, to Minolta Camera Kabushiki Kaisha. Camera objective lens adjustment member. 3,713,725, Cl. 350-247.000.
Ueyama, Masasi: *See—*
Adachi, Syozo; and Ueyama, Masasi, 3,714,048.
Ugine Kuhlmann: *See—*
Blaise, Jean; and Grimaud, Edouard, 3,714,297.
Kremer, Gilbert Victor Henri, 3,714,184.
Ulmschneider, Dieter: *See—*
Lienhard, Klaus; and Ulmschneider, Dieter, 3,714,137.
Ulrich, Henri: *See—*
Smith, Curtis P.; and Ulrich, Henri, 3,714,246.
Ulrich, Henri, to Upjohn Company, The. Di (azidosulfonyl) xanthones. 3,714,194, Cl. 260-335.000.
Umstead, Charles H., to New Jersey Zinc Company, The. Evaporative sulfuric acid recovery from sulfuric acids containing sulfates. 3,713,786, Cl. 23-307.000.
Union Camp Corporation: *See—*
Clark, Kenneth G.; Cook, Thomas J.; De Pass, Ernest T.; and Manfredonia, Abraham, 3,713,954.
Union Carbide Corporation: *See—*
Freeman, Donald C., Jr., 3,713,211.
Kosseim, Alexander Jean-Marie; Kubek, Daniel John; and Somekh, George Solomon, 3,714,034.
Mellors, Geoffrey W.; and Senderoff, Seymour, 3,713,993.
Schober, Donald L.; McGrath, James E.; and Matzner,Markus, 3,714,289.
Somekh, George S., 3,713,289.
Somekh, George S.; Kubek, Daniel J.; and Kosseim, Alexander J., 3,714,033.
Wu, Chisung, 3,713,879.
Union Industrielle Blanzyouest: *See—*
Montacie, Marcel, 3,713,700.
Union Oil Company of California: *See—*
Biale, Giovanni, 3,714,096.
Biale, Giovanni, 3,714,099.
Biale, Giovanni; and Pilling, Richard L., 3,714,100.
Fenton, Donald M., 3,714,270.
Uniroyal, Inc.: *See—*
Klingbeil, Werner W.; and Hartman, Eugene H., 3,713,928.
United Aircraft Corporation: *See—*
Boone, Donald H.; Koss, Donald A.; and Peacock, David E., 3,713,815.
Cronan, John J., 3,714,448.
Fradenburgh, Evan A.; and Kiely, Edmond F., 3,713,751.
Kurti, Alexander, 3,713,752.
Ruckle, Duane L.; and Sprague, Robert A., 3,713,207.
Shaw, Richard Horace, 3,714,018.
West, Roger F., 3,714,503.
United Kingdom Atomic Energy Authority: *See—*
Coast, Geoffrey; Prince, Kenneth; Spruce, Brian; and Morgan, Vernon, 3,713,972.
McIver, Robert Faulds; and Marchbank, Frederick Albert Leslie, 3,713,459.
Mills, Alfred Leonard; and Hartley, Kenneth, 3,714,058.
Rice, Graham; and Pollock, James Francis, 3,714,283.
United Kingdom of Great Britain and Northern Ireland, Minister of Aviation Supply in Her Majesty's Government of the: *See—*
Langley, Kenneth Richard, 3,713,748.
United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the: *See—*
Lovecy, Albert Leonard, 3,713,385.
United States of America
Agriculture: *See—*
Buchanan, Russell A.; and Russell, Charles R., 3,714,087.
Feuge, Reuben O.; Zeringue, Hampden J., Jr.; and Weiss, Theodore J., 3,714,144.
Slodki, Morey E., Smiley, Millie Jo; and Hensley, Dwight E., 3,713,979.
Vail, Sidney L., 3,714,183.
Air Force: *See—*
Hileman, Ronald E.; and Campbell, James T., 3,714,404.
Jaquay, Paul T., 3,714,561.
McDowell, Curtis S.; and Merrill, Claude, 3,714,199.
McDowell, Curtis S.; and Merrill, Claude, 3,714,200.
Von Ohain, Hans J. P.; and Keller, Melvin R., 3,713,970.
Army: *See—*
Lewis, Charles W.; and Hann, Everette O., 3,714,143.
Olsen, Robert E., 3,714,168.
Atomic Energy Commission: *See—*
Auskern, Allan, 3,713,860.
Bell, Michael J.; and Whatley, Marvin E., 3,714,322.
Davis, Francis C.; Cannon, Donald D.; Furman, Francis J., Jr.; and Sease, John D., 3,714,305.
Giorgi, Angelo L.; and Szklarz, Eugene G., 3,713,898.
Hamilton, Gordon W.; Moir, Ralph W.; Osher, John E.; and Post, Richard F., 3,713,967.
Romberger, Karl A.; and Braunstein, Jerry, 3,714,014.
Shults, Wilbur D.; and Kuempel, John R., 3,713,994.
Tallent, Othar K., 3,714,056.
Tetenbaum, Marvin; and Hunt, Paul D., 3,714,060.
Interior: *See—*
Bloom, Philip A.; Hussey, Stuart J.; and Evans, Lamar G., 3,714,325.
Forshey, David R.; and Lisotto, Ermete C., 3,713,918.
Suszer, Adalbert, 3,714,010.

National Aeronautics and Space Administration: *See—*
Deboo, Gordon J.; and Hedlund, Roger C., 3,714,588.
Gold, Harold, 3,713,290.
Jalink, Antony, Jr., 3,714,432.
Naumann, Eugene C.; and Hagood, Gideon J., Jr., 3,714,405.
Rasquinmadison, John R.; and Estes, Marvin F., 3,714,332.
Sivertson, Wilford E., Jr., 3,714,645.
Story, Anne W., 3,714,624.

National Aeronautics and Space Administration; Deputy Administrator; with respect to an invention of:
Carl, George R. Air conditioned suit. 3,713,480, Cl. 165-46.000.
McCann, David H. Phototransistor. 3,714,526, Cl. 317-235.00r.
Paik, William W.; and Chapman, Carl P. Apparatus for recovering matter adhered to a host surface. 3,713,987, Cl. 195-127.000.

Navy: *See—*
Augl, Joseph M., 3,714,189.
Biren, Steven; and Costello, Thomas V., 3,714,620.
Carpenter, David W.; and Yeakey, Jack A., 3,713,395.
Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., 3,714,254.
Crescenzo, Frank G.; Gey, William A.; and Wiebke, Armin T., 3,713,383.
Dare, Sherman E.; Haas, Davey S.; Herold, Stanley J.; Norris, Steven R.; Patterson, Terry V.; and Sloan, Robert E., 3,713,394.
Finvold, Rodger C.; and Davis, Charles M., 3,714,430.
Gilligan, William H.; and McQuistion, William E., 3,714,261.
Grabowski, Joseph P.; and Powell, Walter E., Jr., 3,714,652.
Hanke, August M., 3,713,548.
Helms, Horace H.; Rozner, Alexander G.; and Spencer, Dana E., 3,713,636.
Hill, Jacques A. F.; and Adams, Richard H., 3,713,607.
Hirschel, Louis R., 3,714,552.
Ianuzzi, Anthony P., 3,713,412.
Johnson, Clifford T.; Neuhaus, Herbert M.; Silver, Wallace E.; Whiting, Gordon D.; and Larson, Richard A. N., 3,713,361.
Karp, Raymond E., 3,713,387.
Kershaw, Joseph E., 3,714,661.
Lindsey, Carl B.; and McKenzie, Joe A., 3,714,587.
Northan, Barbara J.; and Boies, David B., 3,714,069.
Parsons, Kenneth C., 3,713,392.
Pieper, Hans D., 3,713,390.
Stout, Lilburn G., Jr.; Butler, Robert F.; and Smith, Thomas S., 3,713,391.
Wicks, Steven A.; and Jones, Robert W., 3,714,654.
Wilhelmsen, Carl R., 3,714,622.
Williams, Robert M., 3,713,750.
Wischhoefer, William J. G.; and Hunley, William H., 3,713,414.
Wolverton, Billy C., 3,714,349.
Woodworth, William H., 3,714,498.

Navy, mesne: *See—*
Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., 3,714,260.
Minton, Robert; and Kamnitsis, Constantine, 3,714,601.

United States Steel Corporation: *See—*
Brickner, Kenneth G., 3,713,812.

Universal Oil Products Company: *See—*
Cyba, Henryk A., 3,714,263.
Gleim, William K. T., 3,714,026.
Gleim, William K. T., 3,714,027.
Hallman, Newt M., 3,714,028.
Hayes, John C.; and Pollitzer, Ernest L., 3,714,281.
Jones, Edwin K., 3,713,615.
Massie, Stephen N., 3,714,228.
Michalko, Edward, 3,714,071.
Stine, Laurence O., 3,714,022.
Stine, Laurence O., 3,714,023.
Symon, Ted, 3,714,284.
Urban, Peter, 3,714,338.

Universal Propulsion Co.: *See—*
Marion, Frank A.; and Mc Spadden, Hugh J., 3,714,047.

Universite de Sherbrooke: *See—*
Picker, Patrick, 3,713,460.

University of California, The Regents of the: *See—*
Hahn, Erwin L.; and McCall, Samuel L., 3,714,438.
Rapoport, Henry, 3,714,156.

Uniwersytet im. Adama Mickiewicza w Pozaniu: *See—*
Pajak, Zdzislaw; Jurga, Kazimierz; and Jurga, Jan, 3,714,551.

Unnewehr, Lewis E., to Ford Motor Company. Sine pulse controller for variable reluctance motor. 3,714,533, Cl. 318-254.000.

Upjohn Company, The: *See—*
Farrissey, William J., Jr.; Rose, James S.; and Sayigh, Adnan A. R., 3,714,130.
Hester, Jackson B., Jr., 3,714,149.
Hester, Jackson B., Jr., 3,714,178.
Lincoln, Frank H.; Schneider, William P.; and Spero, George B., 3,714,353.
Shephard, Kenneth P., 3,714,141.
Smith, Curtis P.; and Ulrich, Henri, 3,714,246.
Szmuszkovicz, Jacob; and Cerda, Elisabeth S., 3,714,186.
Ulrich, Henri, 3,714,194.

Urasaki, Takanori: *See—*
Shima, Takeo; Urasaki, Takanori; and Oka, Isao, 3,714,125.

Urban, Friedrich: *See—*
Pfannmueller, Helmut; Urban, Friedrich; Gropper, Hans; and Gierth, Volker, 3,714,135.

Urban, Peter, to Universal Oil Products Company. Treating a water stream containing a sulfite compound to produce elemental sulfur. 3,714,338, Cl. 423-571.000.

Urban, Urban A. Treatment of soil. 3,713,253, Cl. 47-58.000.

U.S. Philips Corporation: *See—*
Auphan, Michel Joseph; and Perilhou, Jean Robert, 3,713,777.
Boekhorst, Antonius, 3,714,495.
Dijkstra, Homme, 3,714,481.
Fosse, Jacuqes Andre Charles; and Pelletier, Joel Albert, 3,714,419.
Hovens, Paulus Joseph Maria; and Smeulers, Wouter, 3,714,454.
Jacob, Heinz-Jurgen, 3,714,487.
Kaashoek, Johannes, 3,714,500.
Kuijk, Karel Elbert; and Hoogendoorn, Abraham, 3,714,600.
Lagemann, Klaus, 3,714,472.
Notelteirs, Victor Rosallie, 3,713,461.
Reiniger, Friedrich; von Hacht, Reinhard; and Lemmrich, Jurgen, 3,714,427.
Schmidt, Heiner, 3,714,527.
Schroder, Johann; and Van der Sluys, Willem Ludovicus Nicolaas, 3,713,920.
Staas, Frans Adrianus; and Severijns, Adrianus Petrus, 3,713,305.

U.S. Philps Corporation: *See—*
Maria Mes, Johannes Antonius, 3,713,722.

USV Pharmaceutical Corporation: *See—*
Bandurco, Victor; and Shroff, James R., 3,714,182.

Vahle, Erwin; and Senk, Paul, to Singer Company, The. Quick threading thread guide for sewing machine. 3,713,605, Cl. 242-157.000.

Vail, Atlee G., to Sprague Electric Company. Electrical capacitor with film-paper dielectric. 3,714,528, Cl. 317-258.000.

Vail, Sidney L., to United States of America, Agriculture. Bispyrrolidone-formaldehyde addition products and their use as crosslinking agents with cellulose. 3,714,183, Cl. 260-326.300.

Valdes, Silverio Antonio, to GTE Sylvania Incorporated. Electronic volume and on/off circuits for remote control systems. 3,714,578, Cl. 325-319.000.

Valdes, Silverio Antonio; and Waybright, George Cleveland, to GTE Sylvania Incorporated. Electronic volume and on/off circuits for remote control systems. 3,714,579, Cl. 325-319.000.

Valerio, Paul F.; and Werner, Robert M., to Eastman Kodak Company. Lens polishing composition containing diamonds in an epoxide resin matrix. 3,713,796, Cl. 51-298.000.

Van Andel, Eleonoor, to European Atomic Energy Community. Energy converter. 3,713,288, Cl. 60-25.000.

Van Dalen, Leonard; and Gadren, George S., to Seaboard Fabricators, Inc. Wire stripper and cutter. 3,713,215, Cl. 30-90.100.

Van der Sluys, Willem Ludovicus Nicolaas: *See—*
Schroder, Johann; and Van der Sluys, Willem Ludovicus Nicolaas, 3,713,920.

Van Der Toorn, Lambertus J.; Ouwerkerk, Jacobus S. M.; and Van Klinken, Jakob, to Shell Oil Company. Residual oil. 3,714,031, Cl. 208-213.000.

Van Kempen, Charles; and Zamek, Paul, to Simplex Specialty Co., Inc. Conveyor system. 3,713,649, Cl. 271-79.000.

Van Klinken, Jakob: *See—*
Van Der Toorn, Lambertus J.; Ouwerkerk, Jacobus S. M.; and Van Klinken, Jakob, 3,714,031.

Van Nobelen, Arnoldus Hendricus. Device for filling flower pots with earth. 3,713,465, Cl. 141-134.000.

Van Pelt, Richard W.; and Werner, Allen J., to International Business Machines Corporation. Magnetic tape unit capstan and reel motor control apparatus. 3,713,606, Cl. 242-184.000.

Van Santen, Aart; and Sodergard, Bengt, to Allmanna Svenska Elektriska Aktiebolaget. Nuclear reactor having a modular core. 3,713,971, Cl. 176-50.000.

Van Thyne, Ray J.; and Rausch, John J., to Surface Technology Corporation. Nitrided, tantalum base alloys. 3,713,906, Cl. 148-31.500.

Van Thyne, Ray J.; and Rausch, John J., to Surface Technology Corporation. Graded multiphase materials. 3,713,907, Cl. 148-31.500.

Vandenberk, Jan: *See—*
Janssen, Paul Adriaan Jan; Niemegeers, Carlos Jan Ernest Josef; Stokbroekx, Raymond Antoine; and Vandenberk, Jan, 3,714,159.

Vandersall, L.: *See—*
King, Thomas M.; and Vandersall, L., 3,714,066.

Vanderwell Products Limited: *See—*
Hill, Joseph Henry; Kelling, Geoffrey Philip; and Spikes, Roger Hugh, 3,713,714.

Vann, Clyde R.: *See—*
Vann, Roy R.; and Vann, Clyde R., 3,713,334.

Vann, Roy R.; and Vann, Clyde R. Downhole recorder device for logging boreholes. 3,713,334, Cl. 73-152.000.

Varian Associates: *See—*
Anderson, Weston A.; and Helmer, John C., 3,714,417.
Hyde, James S., 3,714,550.
Jory, Howard R., 3,714,592.

Vartanian, Albert Vartanovich: *See—*
Markosian, Marlen Mamukovich; Shermazanian, Yakov Tigranovich; Kazanxhian, Grigory Paravonovich; Avakian, Jury Vardkesovich; and Vartanian, Albert Vartanovich, 3,713,727.

Vecht, Aron, to BDH Chemicals Limited. Method of preparing metallic selenides. 3,714,339, Cl. 423-509.000.

Vedder, Ralph L.: *See—*
Philip, Thoni V.; and Vedder, Ralph L., 3,713,905.
Venn-Brown, Geoffrey C.: *See—*
Bembridge, Henry; and Venn-Brown, Geoffrey C., 3,713,399.
Venobre, Henri: *See—*
Normand, Georges; and Venobre, Henri, 3,713,973.
Vepa AG: *See—*
Fleissner, Heinz, 3,713,219.
Verdol, Joseph A.; Ryan, Patrick W.; and Carrow, Donald J., to Atlantic Richfield Company. Composition. 3,714,110, Cl. 260-33.6aq.
Vereinigte Osterreichische Eisen-und Stahrwerke Aktiengesellschaft: *See—*
Wogerbauer, Alfred, 3,713,205.
Veres, Frank: *See—*
Austin, Lewis M.; Denman, Robert R.; O'Donnell, Thomas P.; and Veres, Frank, 3,713,728.
Vernitron Corporation: *See—*
Fertik, Ira J., 3,713,443.
Vesterling, Karin, to Bosch, Robert, G.m.b.H. Circuit board arrangement including socket members mounted on the circuit board for holding capacitors having rounded bottoms. 3,714,514, Cl. 317-101.00c.
Vetrocope Cokapuania S.p.A: *See—*
Giammerco, Giuseppe, 3,714,327.
Vickers-Zimmer Aktiengesellschaft Planung und Bau von Industrieanlagen: *See—*
Hess, Gunther; Martens, Gerhard; and Pohl, Kurt, 3,713,784.
Vickery, Earl C., to Diamond Squared Industries, Inc. Process for epitaxial growth of diamonds. 3,714,334, Cl. 423-446.000.
Vitali, Joseph D.: *See—*
Freeman, Francis R.; and Vitali, Joseph D., 3,714,590.
Vogel, Christian: *See—*
Sturm, Elmar; and Vogel, Christian, 3,714,217.
Vogel, Paul W.: *See—*
Vogel, Virgil W., deceased; and Vogel, Paul W., 3,713,847.
Vogel, Virgil J.: *See—*
Vogel, Virgil W., deceased; and Vogel, Paul W., 3,713,847.
Vogel, Virgil W., deceased (by Vogel, Virgil J.; co-executor); and Vogel, Paul W. Process for preparing packaged beef products for prolonged storage. 3,713,847, Cl. 99-108.000.
Vogt, Gerd; Kurth, Johannes; and Glaser, Josef, to Mannesmann Aktiengesellschaft, Firma. Method for internal cooling of cast tubes. 3,713,478, Cl. 164-85.000.
Vogt, Kurt; and Maillard, Poland, to OMEGA Brandt, Louis, & Frere S.A. Calendar-watch. 3,713,287, Cl. 58-58.000.
Voigt, William L., to Western Electric Company, Incorporated. Resilient mounts for supporting posts. 3,713,611, Cl. 248-44.000.
Volk, Anthony J. Disposable thermometer structure. 3,713,416, Cl. 116-114.50r.
Volkswagenwerk Aktiengesellschaft: *See—*
Petersen, Hans-Gunther; and Requardt, Heiko, 3,713,331.
Sandhagen, Jurgen, 3,713,428.
Voll, Christl. Transistor indicator circuit in a metal detecting apparatus. 3,714,563, Cl. 324-67.000.
von Hacht, Reinhard: *See—*
Reiniger, Friedrich; von Hacht, Reinhard; and Lemmrich, Jurgen, 3,714,427.
Von Ohain, Hans J. P.; and Keller, Melvin R., to United States of America, Air Force. Cavity reactor with two stage separation. 3,713,970, Cl. 176-45.000.
Von Wimmersperg, Heinrich F. Safety device for restraining passengers. 3,713,695, Cl. 297-384.000.
Vondrak, Mary Frances, to Shell Oil Company. Non-corrosive sulfur-liquid hydrocarbon slurry containing a corrosion inhibiting amount of a polar-containing solvent. 3,714,070, Cl. 252-396.000.
Vorms, Georgy Alfonsovich: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.
Vossos, Peter H., to Nalco Chemical Company. Production of small particle size aqueous colloidal silica sols. 3,714,064, Cl. 252-313.00s.
Vree, Pieter H.: *See—*
Fontijn, Arthur; and Vree, Pieter H., 3,713,773.
Vrijburg, Hans Gerhard; and Bijl, Cornelis Leendert, to Koninklijke Nederlandsche Hoogovens en Staalfabrieken N.V. Process for manufacturing zinc coated steel sheet, and steel sheet obtained by this process. 3,713,902, Cl. 148-6.15z.
Vsesojuzny nauchno-issledovatelsky i proektno-konstruktorsky institut metallurgicheskogo mashinostroenia: *See—*
Zarezankov, Georgy Khristovich; Khokhlov, Alexander Semenovich; Cherepnev, Valery Ivanovich; Druzhinin, Nikolai Sergeevich; and Budtolaev, Konstantin Nikolaevich, 3,713,739.
Vyna-Chem, Inc.: *See—*
Speer, Lawrence, 3,713,926.
Wada, Hisayuki: *See—*
Enomoto, Satoru; Wada, Hisayuki; Fujioka, Mikio; and Koguro, Masao, 3,714,020.
Wada, Masao: *See—*
Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshio; Kawanishi, Masazumi; Sato, Masanori; Hoshiyama, Masao; and Nagao, Taku, 3,714,171.
Wagner, William E.: *See—*
Stilley, George W.; Wagner, William E.; and Kelly, Joseph D., 3,713,798.
Wakai, Shuzo; and Nabae, Mitsuo, to Matsushita Electronics Corporation. Automatic gain control amplifier. 3,714,598, Cl. 330-29.000.
Wakamatsu, Hisato; Kitano, Akira; and Kawai, Hisasi, to Nippondenso Kabushiki Kaishi. Automatic transmission control system for automatic transmissions on vehicles. 3,713,355, Cl. 74-866.000.
Walker Forge, Inc.: *See—*
Andersen, Arne O., 3,713,320.
Walker, Jerome F., to Digital General Corporation. Apparatus and method for testing electrical systems having pulse signal responses. 3,714,571, Cl. 324-133.000.
Walker, Ralph E.: *See—*
Kirchner, Henry P.; Walker, Ralph E.; and Gruver, Robert M., 3,713,877.
Walker, William B., to FMC Corporation. Screening conveyor. 3,713,537, Cl. 209-307.000.
Wallace, Donald G.; and Turek, James A., to Araneida, Inc. System for controlling a boom. 3,713,544, Cl. 212-5.000.
Wallace, George O., to Diversified Industries, Inc.; d/b/a Scullin Steel Company. Railway car center bearing. 3,713,710, Cl. 308-137.000.
Walibaum, Hans Joachim; and Hornschemeyer, Wolfgang, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Method of preparing equipment for holding molten. 3,713,808, Cl. 75-10.00r.
Walliczek, Erwin Gunther: *See—*
Dewar, Robert Alfred; and Walliczek, Erwin Gunther, 3,714,341.
Wallin, Jan-Olof Raymond, to Stece-AB Industrifjadran. Buckles for safety belts. 3,713,192, Cl. 24-230.0at.
Walsh, Carroll H. Hand nutcracker with shell guard and nut unloader. 3,713,468, Cl. 99-580.000.
Walsh, Kenneth A.; and Sandor, Andrew J., to Brush Beryllium Company, The. Beneficiation of beryllium. 3,713,810, Cl. 75-101.00r.
Walter, Harry J. Split needle assembly for catheter tube. 3,713,442, Cl. 128-214.400.
Walton, Edward B.: *See—*
Sirago, James J.; and Walton, Edward B., 3,713,779.
Walton, Peter Leslie: *See—*
Broadbent, Douglas; Turner, Ralph William; and Walton, Peter Leslie, 3,713,981.
Wang, Ting-I.: *See—*
Nakaguchi, Glenn M.; Wang, Ting-I.; and Caserio, Frederick F., Jr., 3,714,202.
Wanner, Ernst: *See—*
Beschmann, Horst; and Wanner, Ernst, 3,713,679.
Ward, Gerald G. Cable laying device. 3,713,300, Cl. 61-72.600.
Warner, Ellis R., Jr.: *See—*
Craig, Sam N.; Warner, Ellis R., Jr.; and Buckman, Wayne T., 3,713,595.
Warner-Lambert Company: *See—*
Zinnes, Harold; Lindo, Neil A.; and Shavel, John, Jr., 3,714,155.
Warwick Electronics, Inc.: *See—*
Denenberg, Jeffrey N.; and Padgett, William J., 3,714,595.
Wascon Systems, Inc.: *See—*
Craig, Sam N.; Warner, Ellis R., Jr.; and Buckman, Wayne T., 3,713,595.
Watanabe, Hikoitsu; and Genma, Sanji. Electric motor hammer and striking tool. 3,713,498, Cl. 173-53.000.
Watanabe, Yoshimoto: *See—*
Fujiwara, Ryozo; Ohaha, Eiji; Maeda, Kazuo; Terada, Fumio; Sugino, Toshiyuki; Arakane, Hiroyasu; and Watanabe, Yoshimoto, 3,714,340.
Watarai, Syu: *See—*
Nishio, Fumihiko; Nishio, Daijiro; Watarai, Syu; Ohkubo, Kinji; and Nakajima, Yosuke, 3,713,829.
Waters, Kenneth H., to Continental Oil Company. Method and apparatus for seismic gain control through seismic signal coherence. 3,714,621, Cl. 340-15.5tc.
Waters, Robert S.; and Spohr, Albert R., to Sunbeam Corporation. Illuminated makeup mirror. 3,714,411, Cl. 240-6.450.
Watking, Dwight Wayland: *See—*
McCracken, Madelyn Iris; Randolph, Glenn Ray; and Watking, Dwight Wayland, 3,713,692.
Watkins, Sidney C., to Avco Corporation. Simplified flat spray nozzle. 3,713,591, Cl. 239-590.300.
Watkinson, Leonard James, to Howson-Algraphy Limited. Presensitized lithographic printing plate and process for preparing same. 3,713,830, Cl. 96-86.00r.
Watson, Billy Ray. Method and apparatus for spotting fluid downhole in a borehole. 3,713,490, Cl. 166-305.000.
Watson, William H., to Zenith Radio Corporation. Polarized light beam scanning with improved angular resolution. 3,713,721, Cl. 350-150.000.
Watt, David A., to Ford Motor Company. Method for insertion of particulate catalytic material in a catalytic converter housing. 3,713,782, Cl. 23-288.00f.
Waybright, George Cleveland: *See—*
Valdes, Silverio Antonio; and Waybright, George Cleveland, 3,714,579.
Wean United, Inc.: *See—*
Adair, James Richard, 3,713,314.
Webb, Derrel D., to Houston Engineers, Inc. Well pipe swage. 3,713,481, Cl. 166-55.000.
Webb, Edward A.: *See—*
Peterson, Carl L.; and Webb, Edward A., 3,714,485.

Weber, A. R., AG: *See—*
Weber, Alwin Rolf, 3,713,626.

Weber, Alwin Rolf, to Weber, A. R., AG. Mixing apparatus for pulverulent or granular material and improved method for mixing such material. 3,713,626, Cl. 259-4.000.

Weber, Ulrich, to Siemens Aktiengesellschaft. Apparatus for improving the signal information in the examination of samples by scanning electron microscopy or electron probe microanalysis. 3,714,424, Cl. 250-49.50a.

Webster, Milo E., to Gillette Company, The. Foam producing and dispensing container. 3,713,586, Cl. 239-326.000.

Weech, Marx E., to General Electric C ompany. Irradiated fuel recovery system. 3,714,324, Cl. 423-10.000.

Wegmuller, Hans; and Keller, Karlheinz, to Ciba-Geigy AG. Long chain alkane or alkene amido benezene sulfonate assisted dyeing of synthetic linear polyamides. 3,713,768, Cl. 8-172.000.

Wei, Peter H. L.; and Bell, Stanley C., to American Home Products Corporation. (2-oxo-azetidino) benzophenone compounds. 3,714,147, Cl. 260-239.00a.

Wei, Peter H. L., to American Home Products Corporation. 3-Benzoyl-3-thiocyanatopropionic acid, alkyl esters and derivatives thereof. 3,714,218, Cl. 260-454.000.

Weidner, Evert C., to Honeywell Inc. Disposable reserve activated electrochemical cell. 3,713,894, Cl. 136-113.000.

Weimann, Gunter: *See—*
Bergmeyer, Hans Ulrich; Haid, Erich; Hochstetter, Michael; and Weimann, Gunter, 3,713,986.

Weisfeld, Joseph: *See—*
Ackerman, Joseph Francis; Beerli, George; Savageau, Robert George; and Weisfeld, Joseph, 3,713,864.

Weisman, Sidney, to Howmedica, Inc. Metal alloy cardiovascular implant device. 3,713,175, Cl. 3-1.000.

Weiss, Francis: *See—*
Bader, Andre; and Weiss, Francis, 3,714,265.

Weiss, Theodore J.: *See—*
Feuge, Reuben O.; Zeringue, Hampden J., Jr.; and Weiss, Theodore J., 3,714,144.

Weld Tooling Corporation: *See—*
Cable, H. Edward; Cable, Herbert E.; and Cable, John A., 3,713,637.

Wells, Richard Farner; and Fry, Robert Eden, to AMP Incorporated. Voltage multiplying wafer capacitor. 3,714,530, Cl. 317-261.000.

Welsch, Walter N., to Dynabrade, Inc. Miniature belt grinder. 3,713,255, Cl. 51-170.0eb.

Welz, Harold C., to Gates Rubber Company, The. Liquid vaporizer. 3,713,424, Cl. 122-356.000.

Wendel, Richard H.: *See—*
Wolfel, Erich R.; and Wendel, Richard H., 3,714,426.

Wenger, Otto: *See—*
Meyer, Albert; Wenger, Otto; and Maag, Oskar, 3,713,315.

Werkzeugmaschinen-Fabrik Oerlikon Buhrle AG: *See—*
Hurlemann, Ernst, 3,713,363.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Luthy, Walter, 3,713,746.

Werner, Allen J.: *See—*
Van Pelt, Richard W.; and Werner, Allen J., 3,713,606.

Werner, Robert M.: *See—*
Valerio, Paul F.; and Werner, Robert M., 3,713,796.

West, Dexter F.; and West, Joseph W., to Cobb, James Edward. Baster and tenderizer. 3,713,378, Cl. 99-346.000.

West, Joseph W.: *See—*
West, Dexter F.; and West, Joseph W., 3,713,378.

West, Roger F., to United Aircraft Corporation. Resonant energy recovery type crt deflection circuit. 3,714,503, Cl. 314-27.0td.

Western Electric Company Incorporated: *See—*
Cranston, Benjamin Howell, 3,713,213.
Holbrook, Robert, 3,713,575.
Kenney, John Thomas, 3,713,998.
Lavric, Drago, 3,713,876.
Lien, Suei-Yuen Paul, 3,713,883.
Sheehan, Leo J., III, 3,713,741.
Smith, Norman F.; and Stocker, Edward T., 3,713,599.
Voigt, William L., 3,713,611.

Western Kraft Corporation: *See—*
Goebel, Henry R., 3,713,576.

Westinghouse Electric Corporation: *See—*
Coley, Kenneth R., 3,714,615.
Cunningham, Tim; and McCleerey, Earl W., 3,713,227.
Evans, George S., 3,713,201.
Goetz, Allan C.; Cortesi, Roger S.; and Hauck, Lester A., 3,713,742.
Larkin, Melvyn W.; and Matta, Richard K., 3,713,911.
Schellenberg, James M., 3,713,210.

Weyerhaeuser Company: *See—*
Chaffers, John W., 3,713,579.
Hanko, Jimmy J., 3,713,530.

Whalen, David F.: *See—*
Johnson, Thomas D.; Whalen, David F.; and White, Robert E., 3,714,393.

Whatley, Marvin E.: *See—*
Bell, Michael J.; and Whatley, Marvin E., 3,714,322.

White, Charles E.: *See—*
Eddy, Thomas A.; and White, Charles E., 3,713,686.

White, R. Winslow, to Rohm & Haas Company. Catalysts and esterification process. 3,714,234, Cl. 260-486.00r.

White, Robert E.: *See—*
Johnson, Thomas D.; Whalen, David F.; and White, Robert E., 3,714,393.

White, William E., Jr., to HydroTech Services, Inc. Connector for tubular members. 3,713,675, Cl. 285-18.000.

Whiting, Gordon D.: *See—*
Johnson, Clifford T.; Neuhaus, Herbert M.; Silver, Wallace E.; Whiting, Gordon D.; and Larson, Richard A. N., 3,713,361.

Whitmarsh, John Robert William: *See—*
Johnson, Christopher Linley; Whitmarsh, John Robert William; and Basford, Kenneth Arnold, 3,713,344.

Whitney, David J.; and Newkirk, Terry F. Microwave ultrasonic delay line. 3,714,609, Cl. 333-30.00r.

Whitney, John A.; Woods, Richard E.; and Hohman, William H., to Franklin Electric Co., Inc. Phase selective telemetry system. 3,714,451, Cl. 307-3.000.

Whittaker Corporation: *See—*
Lasher, Edward A., 3,714,090.
Lasher, Edward A., 3,714,091.

Wick, Paul: *See—*
Hoffmann, Wolfgang; and Wick, Paul, 3,713,526.

Wicks, Steven A.; and Jones, Robert W., to United States of America, Navy. ECM pulse analyzer. 3,714,654, Cl. 343-18.00e.

Widiger, Almar T.; and Kreh, Marvin J., to Dow Chemical Company, The. Non-blocking packaging film comprising an ethylene-vinyl copolymer blended with a fatty acid amide and calcium carbonate. 3,713,965, Cl. 161-254.000.

Wiebke, Armin T.: *See—*
Crescenzo, Frank G.; Gey, William A.; and Wiebke, Armin T., 3,713,383.

Wiechert, Rudolf: *See—*
Hofmeister, Helmut; Steinbeck, Hermann; and Wiechert, Rudolf, 3,714,207.

Wiedmer, Louise. Bed shoe for preventing foot drop. 3,713,437, Cl. 128-25.00r.

Wiener Metallwarenfabrik Smolka & Co.: *See—*
Smolka, Thomas Gordon; and Zelinka, Johann, 3,713,664.

Wierick, Horst, to Bea-Verpackungsmaschinen Cast. Welding apparatus for plastic foils. 3,713,951, Cl. 156-498.000.

Wilber, Thomas W., to Singer Company, The. Document transport mechanism. 3,713,735, Cl. 355-11.000.

Wiley, David R., to Betz Laboratories, Inc. Stabilization of fuel additives. 3,713,792, Cl. 44-4.000.

Wiley, Donald E., to Exomet Incorporated. Exothermic hot topping composition. 3,713,852, Cl. 106-38.270.

Wilhelmsen, Carl R., to United States of America, Navy. Adaptive AGC system. 3,714,622, Cl. 340-16.000.

Willems, Jozef Frans, to Gevaert-Agfa, N.V. Process for the development of photographic material. 3,713,827, Cl. 96-66.300.

Williams, Marguerite R., to Surgical Appliance Industries, Inc. Post-operative garment. 3,713,450, Cl. 128-564.000.

Williams, Raymond L.: *See—*
Beiding, William A.; Emenson, Robert B.; and Williams, Raymond L., 3,714,313.

Williams, Robert G.; and Berthold, Wolfgang K., to International Telephone and Telegraph Corporation. Image comparison device and method. 3,714,439, Cl. 250-201.000.

Williams, Robert M., to United States of America, Navy. Circulation control rotor system. 3,713,750, Cl. 416-20.000.

Williams, Thurston V.; and Cheever, Leo H., to O. K. Tool Company, Inc., The. Controlled tool for machining compound surfaces. 3,713,254, Cl. 51-34.00a.

Williamson, Dennis F., to General Electric Company. Circuit breaker monitor for uninterruptable power systems including a static bypass. 3,714,452, Cl. 307-86.000.

Williford, Jerry G., to Collins Radio Company. RC active filter apparatus. 3,714,603, Cl. 330-109.000.

Wills, John H.: *See—*
Miller, James R.; Pierce, Richard H.; Linton, Robert W.; and Wills, John H., 3,714,068.

Wilson, Bruce N.; and Hindersinn, Raymond R., to Hooker Chemical Corporation. Derivatives of phenolphthalein used in polyurethane preparation. 3,714,079, Cl. 260-2.5aq.

Wilson, Norman E.: *See—*
Jordan, Robert L.; Wilson, Norman E.; and Goldman, Thomas M., 3,714,040.

Wilson, Rexford: *See—*
Gribowski, George J.; Osborne, William B.; and Wilson, Rexford, 3,713,491.

Wilson, Richard A.: *See—*
Elberon, Ira Katz; Wilson, Richard A.; and Mussinan, Cynthia J., 3,713,848.

Windholz, Thomas B.; Johnston, David B. R.; and Patchett, Arthur A., to Merck & Co., Inc. 13-Aminogonanes and N-acyl and N-alkyl derivatives thereof. 3,714,208, Cl. 260-397.000.

Wingrove, Earl R., Jr.: *See—*
Thor, Robert C.; and Wingrove, Earl R., Jr., 3,714,653.

Winkless, Robert A., to Continental Can Company, Inc. Method for pigmented side striping of can bodies. 3,713,862, Cl. 117-17.500.

Winsor, John; and Carruthers, John. Desulphurisation and hydrogenation of aromatic-containing hydrocarbon fractions. 3,714,030, Cl. 208-210.000.

Wischhoefer, William J. G.; and Hunley, William H., to United States of America, Navy. System for attachment to and lifting of objects from deep water. 3,713,414, Cl. 114-50.000.

Wittmann, Ivan E.: *See—*
Lancy, Leslie E.; and Wittmann, Ivan E., 3,714,039.

Wloszek, Joseph T., to Custom Machine, Inc. Conveyor. 3,713,555, Cl. 214-339.000.

Wogerbauer, Alfred, to Vereinigte Osterreichische Eisen-und Stahrwerke Aktiengesellschaft. Process for the production of sections. 3,713,205, Cl. 29-480.000.

Wolert, Hartmut: *See—*
Moller, Klaus; Munch, Dietrich; and Wolert, Hartmut, 3,713,634.

Wolf, Milton: *See—*
Diebold, James L.; and Wolf, Milton, 3,714,253.

Wolf, Milton; and Diebold, James L., to American Home Products Corporation. Spiro [heterocycloalkyl-2' (1'H)-quinazolin]-4' (3'H)-ones. 3,714,093, Cl. 260-25.0qa.

Wolfel, Erich R.; and Wendel, Richard H., to Stoe & Cie, GmbH. Method of X-ray analysis of crystal structure an X-ray goniometer for carrying out said method. 3,714,426, Cl. 250-51.500.

Wolff, Walsrode Aktiengesellschaft: *See—*
Huhn, Helmut; and Kuhn, Horst, 3,714,103.

Wolfgang, Offenbach: *See—*
Lussling, Theodor; Theissen, Ferdinand; and Wolfgang, Offenbach, 3,714,251.

Wolfle, Rudolf; Rucker, Dieter; and Lauerer, Uta, to Siemens Aktiengesellschaft. Method of producing diffused semiconductor components from silicon. 3,713,913, Cl. 148-187.000.

Wolverton, Billy C., to United States of America, Navy. Non-corrosive non-flammable, low toxic organophosphorus detoxifying solution. 3,714,349, Cl. 424-149.000.

Woodrum, Harold L.: *See—*
Frederick, Claud, Jr.; and Woodrum, Harold L., 3,713,217.

Woods, Richard E.: *See—*
Whitney, John A.; Woods, Richard E.; and Hohman, William H., 3,714,451.

Woodworth, William H., to United States of America, Navy. Television camera. 3,714,498, Cl. 315-19.000.

Worley, Lauren D., to Coleman Company, Inc., The. Safety latch assembly for picnic coolers. 3,713,681, Cl. 292-78.000.

Wright, Archibald N.; and Mathewson, Wilfred F., Jr., to General Electric Company. Photopolymerized polycarboxylic acid anhydride film coating and product, and method of forming. 3,713,874, Cl. 117-93.310.

Wright, Arthur J.: *See—*
Lin, Chao-Han; and Wright, Arthur J., 3,713,863.

Wright, Edmund S., to Eltra Corporation. Production of basic refactories. 3,713,855, Cl. 106-58.000.

Wright, Howard N., Jr.; and Hagemeyer, Hugh J., Jr., to Eastman Kodak Company. Process for producing mixed esters from aldehydes. 3,714,236, Cl. 260-494.000.

Wszolek, Walter R.: *See—*
Kehr, Clifton L.; and Wszolek, Walter R., 3,714,290.

Wu, Chan K.: *See—*
Stehle, Peter Fallon; Wu, Chan K.; Loshaek, Samuel; and Dickstein, Jack, 3,714,105.

Wu, Chisung, to Union Carbide Corporation. Flame retardant fibrous material. 3,713,879, Cl. 117-136.000.

Wyant, Gerald Willis. Cabinet for selectively dispensing different types of paper towels. 3,713,561, Cl. 221-44.000.

Wynn, Robert W.: *See—*
Randall, David I.; and Wynn, Robert W., 3,713,805.

Wysocki, Jerzy; and Wysocki, Zygmunt. Method for construction and erection of floor slabs. 3,713,265, Cl. 52-745.000.

Wysocki, Zygmunt: *See—*
Wysocki, Jerzy; and Wysocki, Zygmunt, 3,713,265.

Xerox Corporation: *See—*
Angelini, Dominic J., 3,713,821.
Ferrari, Patrick T.; and Farnsworth, Clinton E., 3,713,645.
Goffe, William L., 3,713,818.
Hagenbach, Robert J.; and Lenhard, Myron J., 3,713,819.
Kluger, Jacob N., 3,713,948.
Moretti, Alfred J., 3,714,377.
Mutschler, Edward C.; and Klavsons, Uldis, 3,714,665.
Sharp, James H., 3,713,861.

Xodar Corporation: *See—*
Clough, Roy L., Jr., 3,713,250.

Yale, Harry L.; and Sowinski, Francis A., to Squibb, E. R., & Sons, Inc. Derivatives of 5,11-dihydrodebenzoxazepones and process therefor. 3,714,192, Cl. 260-333.000.

Yale, Harry L., to Squibb, E. R., & Sons, Inc. Antimicrobial isocyanides. 3,714,221, Cl. 260-465.00f.

Yale, Harry Louis; and Pluscec, Jelka, to Squibb, E. R., & Sons, Inc. Process for preparing 2-acetamido-3-benzyloxy or 3-benzylthiopyridines and derivatives thereof. 3,714,172, Cl. 260-294.860.

Yale, Harry Louis; and Petigara, Ramesh B., to Squibb, E. R., & Sons, Inc. 5,11-Dihydrodibenzoxa (or thia) zepine derivatives. 3,714,201, Cl. 260-333.000.

Yamagami, Teruhiro: *See—*
Kimura, Yutaka; Ariizumi, Yoshio; Masuda, Yutaka; Yamagami, Teruhiro; and Okita, Yasushi, 3,714,378.

Yamamoto, Hisao: *See—*
Okamoto, Tadashi; Kobayashi, Tsuyoshi; and Yamamoto, Hisao, 3,714,148.

Yamato, Eisaku; Miura, Yuji; Wada, Masao; Sekiguchi, Toshio; Kawanishi, Masazumi; Sato, Masanori; Hoshiyama, Masao; and Nagao, Taku, to Tanabe Seiyaku Co., Ltd. 1-(2-Cycloherylethyl)-6 or 7 methoxy-1,2,3,4- tetrahydroisoquinoline and acid addition salts threof. 3,714,171, Cl. 260-286.00r.

Yamauchi, Takashi: *See—*
Takahashi, Masaaki; Yamauchi, Takashi; Okuda, Kensuke; and Ito, Akira, 3,714,021.

Yang, Kuo Shang: *See—*
Pfeiffer, Ralph R.; and Yang, Kuo Shang, 3,714,154.

Yano, Yoshio, to Kabushiki Kaisha Imamura Seisakusho. Conveyor type continuous weighing system. 3,714,401, Cl. 235-151.330.

Yaroslav, Veprek: *See—*
Aigenson, Alexandr Sergeevich; Fryazinov, Vladimir Vasilievich; Malikov, Fatkulla Khairullovich; Sabadash, Julia Sergeevna,; Akimov, Vladimir Stefanovich; Dobrozrakova, Natalia Ivanovna; Berg, Genrikh Arturovich; Ezhov, Boris Mikhailovich; Vorms, Georgy Alonsovich; Kubicka, Rudolf; Yaroslav, Veprek; and Cir, Yaroslav, 3,714,025.

Yazawa, Masahide; Tani, Haruhisa; Matsumoti, Masaki; and Sasaki, Yasuo, to Polymer Processing Research Institute Ltd. Method for developing and converging a band of fibers or threads. 3,713,190, Cl. 19-65.00t.

Yeakey, Ernest Leon: *See—*
Rowton, Richard Lee; and Yeakey, Ernest Leon, 3,714,128.

Yeakey, Jack A.: *See—*
Carpenter, David W.; and Yeakey, Jack A., 3,713,395.

Yokotsuka, Tamotsu; Iwaasa, Takashi; and Fujii, Mituharu, to Kikkoman Shoyu Co., Ltd. Method for preparing a thermostable and alkali-stable protease. 3,713,983, Cl. 195-66.00r.

Yoo, Jin Sun: *See—*
McCoy, John J.; and Yoo, Jin Sun, 3,714,185.

York, Arthur E.: *See—*
Dawson, Peter S. S.; Kurz, Wolfgang G. W.; Anderson, Moffat; and York, Arthur E., 3,713,988.

Yoshida Kogyo Kabushiki Kaisha: *See—*
Ebata, Hiroyuki, 3,713,534.

Yoshida, Shoushi; Iwama, Atsuaki; Odada, Takashi; and Suda, Tetsuo, to Kobe Steel, Ltd. Method for withdrawal of cured tires from a press for shaping and curing tires. 3,714,321, Cl. 264-334.000.

Youngblood, Douglas J.; and Reynolds, David L., to Texaco Inc. Method of catalytic cracking of hydrocarbons. 3,714,024, Cl. 208-78.000.

Youngman, Jon W.: *See—*
Ross, Theron A., Jr.; and Youngman, Jon W., 3,714,547.

Yuyuma, Noboru: *See—*
Fukuda, Yasuhiko; and Yuyuma, Noboru, 3,714,366.

Zaid, Melvin, to Colt Industries Operating Corporation. Range limited projectile system. 3,713,386, Cl. 102-38.000.

Zakharychev, Ardalion Vladimirovich; Serebryakova, Tatyana Andreevna; Ananchenko, Sopia Nikolaevna; and Torgov, Igor Vladimirovich, to Institut Khimii-Prirodnykh Soedineny Im. M.M. Shemuakina akademie Nauk SSSR. Method of producing D-or DL-17α-acetate of 3-methyl ether of D-homoestradiol. 3,714,235, Cl. 260-491.000.

Zamek, Paul: *See—*
Van Kempen, Charles; and Zamek, Paul, 3,713,649.

Zaremski, Donald R., to Allegheny Ludlum Industries, Inc. Trim members and production thereof. 3,713,903, Cl. 148-6.15r.

Zarezankov, Georgy Khristovich; Khokhlov, Alexander Semenovich; Cherepnev, Valery Ivanovich; Druzhinin, Nikolai Sergeevich; and Budtolaev, Konstantin Nikolaevich, to Vsesojuzny nauchno-issledovatelsky i proektno-konstruktorsky institut metallurgicheskogo mshinostroenia. Method for gauging the linear cross-sectional dimensions of moving rolled products and an apparatus for its realization. 3,713,739, Cl. 11-7-72.

Zelinka, Johann: *See—*
Smolka, Thomas Gordon; and Zelinka, Johann, 3,713,664.

Zenith Radio Corporation: *See—*
Sobel, Alan, 3,714,374.
Watson, William H., 3,713,721.

Zerand Corporation: *See—*
Abler, Norman C.; and Zernov, Peter, 3,713,651.

Zeringue, Hampden J., Jr.: *See—*
Feuge, Reuben O.; Zeringue, Hampden J., Jr.; and Weiss, Theodore J., 3,714,144.

Zernov, Peter: *See—*
Abler, Norman C.; and Zernov, Peter, 3,713,651.

Ziegler, Erich. Process for obtaining a beer flavoring. 3,713,838, Cl. 99-28.000.

Zinnes, Harold; Lindo, Neil A.; and Shavel, John, Jr., to Warner-Lambert Company. 4-Hydroxy-2, n-dimethyl-2h-1,2-benzothiazine -3-carboxanilide 1,1-dioxide and process therefor. 3,714,155, Cl. 260-243.00r.

Zondler, Helmut; and Pfleiderer, Wolfgang, to Ciba-Geigy AG. Aminoacetals and aminoketals, processes for their manufacture and their use. 3,714,196, Cl. 260-340.900.

Zupez, John A., to Abex Corporation. Fluid railway side bearings. 3,713,398, Cl. 105-199.0cb.

Zviak, Charles: *See—*
Charle, Roger; Kalopissis, Gregoire; and Zviak, Charles, 3,714,049.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF JANUARY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Crosman Arms Co., Inc.: *See*—
Vadas, John F., and Desrochers. Re. 27,568.
Desrochers, Donald A.: *See*—
Vadas, John F., and Desrochers. Re. 27,568.
Vadas, John F., and D. A. Desrochers, to Crosman Arms Co., Inc. Gas-powered pistol. Re. 27,568, 1–30–73, Cl. 124—11.

LIST OF DESIGN PATENTEES

Ainslie, Dianne B., to Eastman Kodak Co. Motion picture projector or the like. 226,236, 1–30–73, Cl. D61—1.
Allstar Verbrauchsqucter GmbH & Co. KG: *See* Krusche, Kurt R. 226,248.
American Can Co.: *See*—
Bielicki, John J., and Davis. 226,169.
Davis, Raymond H., Bielicki, Murphy, and Ziehmer. 226,170.
Holc, Henry S., and Wilkinson. 226,171.
American Home Products Corp.: *See*—
Cleeland, Raymond T. 226,232.
Weeber, Marion. 226,230.
Weeber, Marion. 226,231.
Anderson, Douglas W., to Burgess Vibrocrafters Inc. Lawn sprinkler. 226,193, 1–30–73, Cl. D23—7.
Anderson, Eldon, Jr., to General Electric Co. Luminaire. 226,217, 1–30–73, Cl. D48—23.
Angibaud, Rene M., to Societe les Piles Wonder. Electric lamp casing. 226,218, 1–30–73, Cl. D48—24.
Aureie Marcio Inc.: *See*—
Marois, Jules. 226,189.
Baugh, Benjamin C., R. R. Deines, and F. O. Gruver, Jr., to The Coleman Co. Inc. Heater. 226,195, 1–30–73. Cl. D23—124.
Bender, Lloyd F. Valve. 226,194, 1–30–73, Cl. D23—19.
Bertanzetti, Ralph C. Display rack for tape cartridges. 226,158, 1–30–73, Cl. D6—190.
Bielicki, John J.: *See*—
Davis, Raymond H., Bielicki, Murphy, and Ziehmer. 226,170.
Bielicki, John J., and R. H. Davis, to American Can Co. Bottle. 226,169, 1–30–73, Cl. D9—116.
Blackwelder Mfg. Co.: *See*—
Schmidt, Leis W. 226,224.
Boak, James E. Legless lounge chair. 226,153, 1–30–73, Cl. D6—37.
Bock & Schupp: *See*—
Hoffmann, Ewald. 226,214.
Bo-Lo Co.: *See*—
Rankin, Vance O., Jr., and Howell. 226,206.
Boyd, Holmes E. Sewage septic tank. 226,192, 1–30–73, Cl. D23—2.
Brainerd, Andrew W., K. H. and S. W. Shoe cleaning-polishing device. 226,249, 1–30–73, Cl. D86—11.
Brainerd, Kent H.: *See*—
Brainerd, Andrew W., K. H. and S. W. 226,249.
Brainerd, Stuart W.: *See*—
Brainerd, Andrew W., K. H. and S. W. 226,249.
Braun Aktiengesellschaft: *See*—
Rams, Dieter. 226,220.
Breger, Carl-Arne, to Telefonaktiebolaget LM Ericsson. Telephone instrument. 226,199, 1–30–73, Cl. D26—14.
Brindley, Robert E., to Union Carbide Corp. Portable hand lantern. 226,219, 1–30–73. Cl. D48—24.
Brinkman, Jerry A. Reel for string. 226,166, 1–30–73, Cl. D8—222.
Burgess Vibrocrafters Inc.: *See*—
Anderson, Douglas W. 226,193.
Bystedt, Dexter M., and T. R. Stanley, to Continental Can Co., Inc. Can or similar article. 226,175, 1–30–73, Cl. D9—216.
Bystedt, Dexter M., and T. R. Stanley, to Continental Can Co., Inc. Can or similar article. 226,176, 1–30–73, Cl. D9—216.
Bystedt. Dexter M., and T. R. Stanley, to Continental Can Co., Inc. Can or similar article. 226,177, 1–30–73, Cl. D9—216.
Bystedt, Dexter M., and T. R. Stanley, to Continental Can Co., Inc. Can or similar article. 226,178, 1–30–73, Cl. D9—216.
Bystedt, Dexter M., and T. R. Stanley, to Continental Can Co., Inc. Can or similar article. 226,179, 1–30–73, Cl. D9—216.
C. G. Originals: *See*—
Gibbs, Dwight, and Carter. 226,203.
Cairns, Maurice M., to North Pacific Products, Inc. Bootjack. 226,245, 1–30–73, Cl. D86—10.
Carreiro, Julian A., assignor of a fractional part interest to Angelo N. Giordano. Cue stick. 226,205, 1–30–73, Cl. D34—5.
Carreiro, Julian A., assignor of a fractional part interest to Angelo N. Giordano. Telescoping cue stick. 226,207, 1–30–73, Cl. D34—5.
Carter, Raymond R.: *See*—
Gibbs, Dwight, and Carter. 226,203.
Cleeland, Raymond T., to American Home Products Corp. Spoon or similar article. 226,232, 1–30–73, Cl. D54—12.
Coleman Co. Inc., The: *See*—
Baugh, Benjamin C., Deines, and Gruver. 226,195.
Continental Can Co., Inc.: *See*—
Bystedt, Dexter M., and Stanley. 226,175.
Bystedt, Dexter M., and Stanley. 226,176.
Bystedt, Dexter M., and Stanley. 226,177.
Bystedt, Dexter M., and Stanley. 226,178.
Bystedt, Dexter M., and Stanley. 226,179.
Dainippon Ink and Chemicals, Inc.: *See*—
Fujii, Mituru, and Narusawa. 226,183.
Daniel, Eugene T., to Mattel, Inc. A stylized model truck. 226,211, 1–30–73, Cl. D34—15.
Danielson, Thomas R., D. R. Fleming, and F. Sturner, to Lockheed Aircraft Corp. Articulated armored vehicle. 226,182, 1–30–73, Cl. D14—3.
Datavision, Inc.: *See*—
King, William L. 226,198.
Davis, Raymond H.: *See*—
Bielicki, John J., and Davis. 226,169.
Davis, Raymond H., J. J. Bielicki, J. C. Murphy, and G. P. Ziehmer, to American Can Co. Bottle. 226,170, 1–30–73, Cl. D9—116.
Dawley, Raymond B., and C. L. Joyce. An outdoor cash box-imprinter hood. 226,225, 1–30–73, Cl. D52—4.
Deines, Robert R.: *See*—
Baugh, Benjamin C., Deines, and Gruver. 226,195.
Del Ponte, Irvin C. Retractable rope hook for vehicles. 226,167, 1–30–73, Cl. D8—232.
Denny, Ralph L. Lock design. 226,163, 1–30–73, Cl. D8—131.
Denzey, Trevor W.: *See*—
Grant, Benton H., and Denzey. 226,244.
Diforte, Paul A. Spare tire carrier. 226,190, 1–30–73, Cl. D14—30.
Di Maio, Anthony, to Marson Corp. Rivet setting tool or similar article. 226,159, 1–30–73, Cl. D8—51.
Donato, Anthony C., to Lightolier Inc. Outdoor lighting fixture. 226,222, 1–30–73, Cl. D48—31.
Dowding, Maurice H. Portable lawn stand for a tumber or the like. 226,152, 1–30–73, Cl. D6—20.
Drieschman, Don F.: *See*—
Duecker, Willard J., and Drieschman. 226,246.
Duecker, Willard J., and D. F. Drieschman; said Drieschman assignor to said Duecker. Wig drier. 226,246, 1–30–73, Cl. D86—10.
Eastman Kodak Co.: *See*—
Ainslie, Dianne B. 226,236.
Fitzgibbon, James A. Combined mirror and bathroom accessories holder. 226,156, 1–30–73, Cl. D6—91.
Fleming, David R.: *See*—
Danielson, Thomas R., Fleming, and Sturner. 226,182.
Freeman Supply Co., The: *See*—
Rusk, Gerald R., and Koch. 226,228.
Rusk, Gerald R., and Koch. 226,229.
Freund, James R., to Pennsylvania Pacific Corp. Pallet. 226,185, 1–30–73. Cl. D14—3.
Friedman, Aaron I. Stanchion. 226,200, 1–30–73, Cl. D28—1.
Fuchs, Robert V.: *See*—
Ganus, James W., and Fuchs. 226,210.
Fujii, Mituru, and I. Narusawa, to Dainippon Ink and Chemicals, Inc. Pallet for transportation. 226,183, 1–30–73, Cl. D14—3.
Furukawa, Masaaki, to Hitachi, Ltd. Slide projector. 226,238, 1–30–73, Cl. D61—1.
Futorian Corp.: *See*—
Winrow, Thomas. 226,155.
Ganus, James W., and R. V. Fuchs. Design for fishing game well. 226,210, 1–30–73, Cl. D34—15.
General Electric Co.: *See*—
Anderson Eldon Jr. 226,217.
Genin, Robert I., to Questor Corp. Barn toy. 226,209, 1–30–73, Cl. D34—15.
Gibbs, Dwight W., and R. R. Carter, to C. G. Originals. Golf club with auxiliary fixtures. 226,203, 1–30–73, Cl. D34—5.
Gillette Co., The: *See*—
Muscatiello. Ralph A. 226,168.
Weiss, Reinhold M. 226,242.
Giordano, Angelo N.: *See*—
Carreiro, Julian A. 226,205.
Carreiro, Julian A. 226,207.

Goldsmith, Herbert D.: *See*—
Talge, Henry J., and Goldsmith. 226,243.
Grant Airmass Corp.: *See*—
Grant, Benton H., and Denzey. 226,244.
Grant, Benton H., and T. W. Denzey, to Grant Airmass Corp. Invalid bathing lift for bathtubs or the like. 226,244, 1–30–73, Cl. D83—1.
Gruver, Floyd O., Jr.: *See*—
Baugh, Benjamin C., Deines, and Gruver. 226,195.
Hanna, Richard M. Fishing lure. 226,191, 1–30–73, Cl. D22—27.
Hermanson, Terry, to Mr. Christmas Inc. Adapter for mounting limbs on artificial trees. 226,173, 1–30–73, Cl. D8—255.
Hewlett-Packard Co.: *See*—
Liljenwall, Edward T. 226,196.
Liljenwall, Edward T. 226,197.
Hillis, Donald A. Holder for coasters. 226,215, 1–30–73, Cl. D44—10.
Hitachi, Ltd.: *See*—
Furukawa, Masaaki. 226,238.
Hoagland, Peter S. Transparent drafting device having raised handle device. 226,226, 1–30–73, Cl. D52—6.
Hoffmann, Ewald, to Bock & Schupp. Watch dial. 226,214, 1–30–73, Cl. D42—1.
Holc, Henry S., and H. E. Wilkinson, to American Can Co. Container end. 226,171, 1–30–73, Cl. D9—253.
Honeywell Inc.: *See*—
Quinn, Peter T. 226,237.
Howell, George A.: *See*—
Rankin, Vance O., Jr., and Howell. 226,206.
Hyer Hardware Mfg. Co.: *See*—
James, David F. 226,164.
Indovina, Frank J. Golf club putter. 226,204, 1–30–73, Cl. D34—5.
Introini, Vittorio, to Proposals S.r.L. Armchair. 226,154, 1–30–73, Cl. D6—69.
James, David F., to Hyer Hardware Mfg. Co. Ornamental Wing strap for use with hinges. 226,164, 1–30–73. Cl. D8—179.
Joyce, Chester L.: *See*—
Dawley, Raymond B., and Joyce. 226,225.
Kessler, Gerald. Multiple pinhole magnifier. 226,235, 1–30–73, Cl. D57—1.
King, William L., to Datavision, Inc. Video signal generating keyboard. 226,198, 1–30–73, Cl. D26—5.
Koch, Robert E.: *See*—
Rusk, Gerald R., and Koch. 226,228.
Rusk, Gerald R., and Koch. 226,229.
Kronman, Albert F., to Lindar Mfg. Corp. Electric scissors. 226,160, 1–30–73, Cl. D8—61.
Krusche, Kurt R., to Allstar Verbrauchsqucter GmbH & Co. KG. Double-sided illuminated mirror. 226,248, 1–30–73, Cl. D86—10.
Langieri, Michael: *See*—
Meyers, Michael R., and Langieri. 226,208.
Leotta, Samuel S.: *See*—
Myers, Earl D., and Leotta. 226,227.
Levin, Monte L., to Scovill Mfg. Co. Electric hair dryer. 226,247, 1–30–73, Cl. D86—10.
Lightolier Inc.: *See*—
Donato, Anthony C. 226,222.
Liljenwall, Edward T., to Hewlett-Packard Co. Casing for a portable electronic calculator. 226,196, 1–30–73, Cl. D26—5.
Liljenwall, Edward T., to Hewlett-Packard Co. Casing for a portable electronic calculator. 226,197, 1–30–73, Cl. D26—5.
Lindar Mfg. Corp.: *See*—
Kronman, Albert F. 226,160.
Lockheed Aircraft Corp.: *See*—
Danielson, Thomas R., Fleming, and Sturner. 226,182.
Lutzker, Robert S. Can resealing closure. 226,180, 1–30–73, Cl. D9—254.
MacDaniel, Gene D.: *See*—
McElvy, Howell T., and MacDaniel. 226,172.
Marois, Jules, to Aurele Marolo Inc. Sleigh. 226,189, 1–30–73, Cl. D14—24.
Marson Corp.: *See*—
Di Maio, Anthony. 226,159.
Matsushita Electric Industrial Co., Ltd.: *See*—
Okabe, Ken. 226,233.
Mattel, Inc.: *See*—
Daniel, Eugene T. 226,211.
McElvy, Howell T., and G. D. MacDaniel, to Sweetheart Plastics, Inc. Container lid. 226,172. 1–30–73, Cl. D9—254.
Melnick, Dennis M., to Pallet Development Inc. Pallet. 226,186, 1–30–73, Cl. D14—3.
Melnick, Dennis M., to Pallet Development Inc. Pallet. 226,187, 1–30–73, Cl. D14—3.
Meyer, Gene R. Bouquet holder. 226,213, 1–30–73, Cl. D35—3.
Meyers, Michael R., and M. Langieri, to Questor Corp. Animal figure toy. 226,208, 1–30–73, Cl. D34—15.
Miller, Albert E. Self-rewinding reel unit for rope. 226,165, 1–30–73, Cl. D8—220.
Mr. Christmas Inc.: *See*—
Hermanson, Terry. 226,173.
Mr. Herbert Headwear, Inc., New York, N.Y. 711,564, canc. Cl. 39.
Moller, Paul S. Combination muffler and spark arrestor for internal combustion engines. 226,184, 1–30–73, Cl. D14—6.
Murphy, John C.: *See*—
Davis, Raymond H., Bielicki, Murphy, and Ziehmer. 226,170.
Muscatiello, Ralph A., to The Gillette Co. Combined bottle and cap therefor. 226,168, 1–30–73, Cl. D9—71.
Myers, Earl D., and S. S. Leotta, to Ohaus Scale Corp. Weighing scale. 226,227, 1–30–73, Cl. D52—10.
Nahanni Mfg. Ltd.: *See*—
Varner, William L. 226,239.
Narusawa, Izuml.: *See*—
Fujii, Mituru, and Narusawa. 226,183.
National Distillers and Chemical: *See*—
Osborn, John R. 226,174.
Nelson, Alfred U. and A. L. Pederson. Trash container. 226,223, 1–30–73, Cl. D49—30.
North Pacific Products, Inc.: *See*—
Cairns, Maurice M. 226,245.
Ohaus Scale Corp.: *See*—
Myers, Earl D., and Leotta. 226,227.
Okabe, Ken, to Matsushita Electric Industrial Co., Ltd. Combined record player and amplifier or similar article. 226,233, 1–30–73, Cl. D56—4.
Osborn, John R., to National Distillers and Chemical. Bottle. 226,174, 1–30–73, Cl. D9—44.
Pallet Development Inc.: *See*—
Melnick, Dennis M. 226,186.
Melnick, Dennis M. 226,187.
Paulsen, Harry A. Door lock operator. 226,161, 1–30–73, Cl. D8—88.
Pederson, Alder L.: *See*—
Nelson, Alfred U., and Pederson. 226,223.
Pennsylvania Pacific Corp.: *See*—
Freund, James R. 226,185.
Proposals S.r.L.: *See*—
Introini, Vittorio. 226,154.
Questor Corp.: *See*—
Genin, Robert I. 226,209.
Meyers, Michael R., and Langieri. 226,208.
Quinn, Peter T., to Honeywell Inc. Camera flash mounting bracket. 226,237, 1–30–73, Cl. D61—1.
Rams, Dieter, to Braun Aktiengesellschaft. Table lighter. 226,220, 1–30–73, Cl. D48—27.
Rankin, Vance O., Jr., and G. A. Howell, to Bo-Lo Co. Paddle. 226,206, 1–30–73, Cl. D34—5.
Reed, Richard G. Snowmobile. 226,188, 1–30–73, Cl. D14—24.
Rice, Macon D. Lamp shade. 226,216, 1–30–73, Cl. D48—16.
Rossi, Anthony V. Interchangeable chess piece. 226,202, 1–30–73, Cl. D34—5.
Rusk, Gerald R., and R. E. Koch, to The Freeman Supply Co. Pattern plates. 226,228, 1–30–73, Cl. D54—8.
Rusk, Gerald R., and R. E. Koch, to The Freeman Supply Co. Pattern plates. 226,229, 1–30–73, Cl. D54—8.
Schmidt, Lewis W., to Blackwelder Mfg. Co. Portable refuse container with unitary packer. 226,224, 1–30–73, Cl. D49—32.
Scovill Mfg. Co.: *See*—
Levin, Monte L. 226,247.
Societe les Piles Wonder: *See*—
Angibaud, Rene M. 226,218.
Songrand Corp., The: *See*—
Talge, Henry J., and Goldsmith. 226,243.
Stanley, Thomas R.: *See*—
Bystedt, Dexter M., and Stanley. 226,175.
Bystedt, Dexter M., and Stanley. 226,176.
Bystedt, Dexter M., and Stanley. 226,177.
Bystedt, Dexter M., and Stanley. 226,178.
Bystedt, Dexter M., and Stanley. 226,179.
Steinkamp, Norman A., to Sunbeam Corp. Combined ice crusher and drink mixer appliance. 226,250, 1–30–73, Cl. D89—1.
Sturner, Frederick: *See*—
Danielson, Thomas R., Fleming, and Sturner. 226,182.
Sunbeam Corp.: *See*—
Steinkamp, Norman A. 226,250.
Sweetheart Plastics, Inc.: *See*—
McElvy, Howell T., and MacDaniel. 226,172.
Swenson, Carl A. Toy vehicle chassis. 226,212, 1–30–73, Cl. D34—15.
Talge, Henry J., and H. D. Goldsmith, to The Songrand Corp. Combined tub and whirlpool circulator. 226,243, 1–30–73, Cl. D83—1.
Tarics, Alexander G. Stadium roof. 226,181, 1–30–73, Cl. D13—1.
Telefonaktiebolaget LM Ericsson: *See*—
Breger, Carl-Arne. 226,199.
Twedt, Janet R. Combined candle and container therefor. 226,240, 1–30–73, Cl. D73—1.
Union Carbide Corp.: *See*—
Brindley, Robert E. 226,219.
Varner, William L., to Nahanni Mfg Ltd. House boat. 226,239, 1–30–73, Cl. D71—1.
Ward, Billy R.: *See*—
Ward, Robert A. and B. R. 226,201.
Ward, Robert A. and B. R. Gameboard. 226,201, 1–30–73, Cl. D34—5.
Weeber, Marion, to American Home Products Corp. Spoon or similar article. 226,230, 1–30–73, Cl. D54—12.
Weeber, Marion, to American Home Products Corp. Spoon or similar article. 226,231, 1–30–73, Cl. D54—12.
Weiss, Reinhold M., to The Gillette Co. Toaster. 226,242, 1–30–73, Cl. D81—10.
Wilkinson, Harlen E.: *See*—
Holc, Henry S., and Wilkinson. 226,171.
Winrow, Thomas, to Futorian Corp. Chair. 226,155, 1–30–73, Cl. D6—73.
Winrow, Thomas. Table. 226,157, 1–30–73, Cl. D6—177.
Yoshinaga Prince Co., Ltd.: *See*—
Yoshinaga, Sadao. 226,221.
Yoshinaga, Sadao, to Yoshinaga Prince Co., Ltd. Cigarette lighter. 226,221, 1–30–73, Cl. D48—27.
Zelenko, Harry. Illuminable memo pad holder. 226,241, 1–30–73, Cl. D74—1.
Ziaylek, Theodore, Jr. Fireman's tool. 226,162, 1–30–73, Cl. D8—81.
Ziehmer, George P.: *See*—
Davis, Raymond H., Bielicki, Murphy, and Ziehmer. 226,170.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 30, 1973

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
74 3,713,174
CLASS 3
1 3,713,175
CLASS 4
3,713,176
95 3,713,177
112 3,713,178
185 3,713,179
3,713,180
CLASS 5
176R 3,713,181
319 3,713,182
CLASS 8
21C 3,713,767
172 3,713,768
173 3,713,769
177AB 3,713,770
CLASS 13
16 3,714,368
CLASS 14
71 3,713,183
CLASS 15
229B 3,713,184
354 3,713,185
CLASS 16
45 3,713,186
CLASS 17
32 3,713,187
70 3,713,188
3,713,189
CLASS 19
65T 3,713,190
CLASS 23
230B 3,713,772
230R 3,713,771
232 3,713,773
253R 3,713,774
3,713,775
3,713,776
259 3,713,777
3,713,778
3,713,779
3,713,780
284 3,713,781
288F 3,713,782
3,713,783
288R 3,713,784
292 3,713,785
307 3,713,786
CLASS 24
201A 3,713,191
230AT 3,713,192
CLASS 25
132 3,713,193
CLASS 26
18.5 3,713,219
CLASS 29
103A 3,713,194
155C 3,713,195
182.2 3,713,787
182.7 3,713,788
182.8 3,713,789
195 3,713,790
196.3 3,713,791
203B 3,713,196
3,713,197
208C 3,713,198
211R 3,713,199
267 3,713,200
414 3,713,201
423 3,713,202
428 3,713,203
460 3,713,204
480 3,713,205
494 3,713,206
498 3,713,207
593 3,713,210
597 3,713,208
3,713,209
599 3,713,211
603 3,713,212
620 3,713,213
628 3,713,214

CLASS 30
90.1 3,713,215
287 3,713,217
897C 3,714,298
CLASS 32
57 3,713,221
64 3,713,222
CLASS 33
24C 3,713,223
126.7 3,713,224
CLASS 34
10 3,713,225
53 3,713,226
99 3,713,227
CLASS 35
24C 3,713,229
35A 3,713,228
CLASS 36
2.5AL 3,713,231
7.3 3,713,232
61 3,713,233
CLASS 37
2R 3,713,234
CLASS 40
2.2 3,713,235
33 3,713,236
132D 3,713,237
158 3,713,238
CLASS 42
1Y 3,713,239
15 3,713,240
69B 3,713,241
70E 3,713,242
CLASS 43
53.5 3,713,243
57.5R 3,713,244
110 3,713,245
CLASS 44
4 3,713,792
52 3,713,793
CLASS 46
17 3,713,246
3,713,247
23 3,713,248
74R 3,713,249
92 3,713,250
120 3,713,252
132 3,713,251
CLASS 47
58 3,713,253
CLASS 48
190 3,713,794
CLASS 51
34A 3,713,254
170EB 3,713,255
295 3,713,795
298 3,713,796
353 3,713,256
CLASS 52
36 3,713,257
90 3,713,258
111 3,713,259
187 3,713,260
289 3,713,261
296 3,713,262
403 3,713,263
489 3,713,264
745 3,713,265
CLASS 53
26 3,713,266
112B 3,713,267
334 3,713,268
373 3,713,269
CLASS 55
16 3,713,270
3,713,271
33 3,713,272
75 3,713,273
164 3,713,274
222 3,713,276
223 3,713,277
269 3,713,278
319 3,713,279
360 3,713,280

387 3,713,281
CLASS 56
328R 3,713,282
364 3,713,283
3,713,284
CLASS 58
39.5 3,713,285
53 3,713,286
58 3,713,287
CLASS 60
25 3,713,288
36 3,713,289
39.28R 3,713,290
52VS 3,713,291
54.5P 3,713,292
267 3,713,293
303 3,713,294
452 3,713,295
3,713,296
CLASS 61
30 3,713,298
36R 3,713,297
70 3,713,299
72.3 3,713,275
72.6 3,713,300
3,713,301
CLASS 62
3 3,713,302
123 3,713,303
341 3,713,304
500 3,713,305
CLASS 64
14 3,713,306
CLASS 65
91 3,713,797
106 3,713,798
273 3,713,799
CLASS 66
132 3,713,307
163 3,713,308
CLASS 70
38A 3,713,309
364A 3,713,310
369 3,713,311
CLASS 71
14 3,713,800
29 3,713,801
3,713,802
45 3,713,803
78 3,713,804
86 3,713,805
93 3,713,806
3,713,807
CLASS 72
8 3,713,313
10 3,713,312
19 3,713,314
100 3,713,315
102 3,713,316
217 3,713,317
283 3,713,318
284 3,713,319
361 3,713,320
391 3,713,321
410 3,713,322
467 3,713,323
CLASS 73
1R 3,713,324
4R 3,713,325
32 3,713,327
41 3,713,326
55 3,713,328
67.9 3,713,329
93 3,713,330
117 3,713,332
117.2 3,713,331
141A 3,713,333
152 3,713,334
178R 3,713,335
189 3,713,336
205R 3,713,337
293 3,713,338
359 3,713,339
384 3,713,340
406 3,713,341
422 3,713,342

517R 3,713,343
546 3,713,344
CLASS 74
1.5 3,713,345
42 3,713,346
231R 3,713,347
240 3,713,348
409 3,713,349
551.9 3,713,350
645 3,713,351
665GB 3,713,352
730 3,713,353
732 3,713,354
866 3,713,355
CLASS 75
10R 3,713,808
68B 3,713,809
68R 3,713,811
101R 3,713,810
126B 3,713,812
135 3,713,813
156.5 3,713,814
171 3,713,815
206 3,713,816
211 3,713,817
CLASS 81
177G 3,713,356
CLASS 83
1 3,713,357
35 3,713,358
523 3,713,471
718 3,713,470
790 3,713,466
CLASS 86
1 3,713,359
3,713,360
22 3,713,361
CLASS 89
14D 3,713,362
185 3,713,363
CLASS 91
25 3,713,365
47 3,713,366
231 3,713,367
CLASS 92
13.1 3,713,364
CLASS 94
18 3,713,368
CLASS 95
10C 3,713,369
11L 3,713,370
44C 3,713,371
53EB 3,713,372
53R 3,713,373
59 3,713,374
82 3,713,375
CLASS 96
1SD 3,713,819
1R 3,713,818
1.5 3,713,820
3,713,821
3,713,822
48HD 3,713,823
48PD 3,713,824
49 3,713,825
66.3 3,713,827
66.4 3,713,826
74 3,713,828
85 3,713,829
86R 3,713,830
88 3,713,831
101 3,713,832
114 3,713,833
3,713,834
124 3,713,835
CLASS 98
110 3,713,376
CLASS 99
2VM 3,713,836
17 3,713,837
28 3,713,838
31 3,713,839
51 3,713,840
60 3,713,841
65 3,713,842

79 3,713,843
91 3,713,844
94 3,713,845
107 3,713,846
108 3,713,847
140R 3,713,848
151 3,713,218
174 3,713,849
283 3,713,377
346 3,713,378
349 3,713,379
422 3,713,380
452 3,713,850
459 3,713,220
580 3,713,468
CLASS 100
100 3,713,381
112 3,713,382
CLASS 102
4 3,713,387
6 3,713,383
27R 3,713,384
28R 3,713,385
38 3,713,386
3,713,388
49.7 3,713,389
67 3,713,390
70 3,713,392
3,713,393
70.2A 3,713,391
90 3,713,394
103 3,713,395
CLASS 104
9 3,713,396
CLASS 105
136 3,713,397
199CB 3,713,398
358 3,713,399
406R 3,713,400
CLASS 106
38.22 3,713,851
38.27 3,713,852
39DV 3,713,854
39.5 3,713,853
58 3,713,855
96 3,713,856
288Q 3,713,857
291 3,713,858
308N 3,713,859
CLASS 107
57B 3,713,401
CLASS 110
8R 3,713,402
32R 3,713,403
CLASS 111
1 3,713,404
CLASS 112
76 3,713,405
121.15 3,713,406
3,713,408
221 3,713,407
CLASS 113
12 3,713,409
CLASS 114
.5T 3,713,410
16E 3,713,411
16R 3,713,412
20R 3,713,413
50 3,713,414
230 3,713,415
CLASS 116
114.5R 3,713,416
137A 3,713,417
CLASS 117
8.5 3,713,860
15 3,713,861
17.5 3,713,862
36.2 3,713,863
38 3,713,864
46CC 3,713,865
50 3,713,866
54 3,713,867
65.2 3,713,868
70A 3,713,869
71R 3,713,870

72 3,713,871
75 3,713,872
93.31 3,713,874
93.4R 3,713,873
98 3,713,875
102M 3,713,876
123A 3,713,877
135.5 3,713,878
136 3,713,879
138.8B 3,713,880
155UA 3,713,881
169R 3,713,882
201 3,713,883
211 3,713,884
212 3,713,885
234 3,713,886
235 3,713,887
CLASS 118
15 3,713,418
47 3,713,419
212 3,713,420
404 3,713,421
637 3,713,422
CLASS 119
1 3,713,423
CLASS 122
356 3,713,424
CLASS 123
8.13 3,713,425
8.29 3,713,426
32EA 3,713,427
119A 3,713,428
127 3,713,429
139AW 3,713,430
CLASS 124
11R Re.27,568
CLASS 125
39 3,713,431
CLASS 126
38 3,713,432
116R 3,713,433
CLASS 128
2C 3,713,434
2.06E 3,713,435
2.08 3,713,436
25R 3,713,437
3,713,438
63 3,713,439
188 3,713,440
214R 3,713,441
214.4 3,713,442
275 3,713,444
276 3,713,443
283 3,713,445
327 3,713,446
347 3,713,447
351 3,713,448
419P 3,713,449
564 3,713,450
CLASS 131
9 3,713,451
198A 3,713,452
CLASS 132
9 3,713,453
3,713,454
40 3,713,455
CLASS 136
6 3,713,888
3,713,889
20 3,713,890
30 3,713,891
86A 3,713,892
89 3,713,893
113 3,713,894
114 3,713,895
133 3,713,896
153 3,713,897
233 3,713,899
CLASS 137
81.5 3,713,456
218 3,713,457
312 3,713,458
357 3,713,459
566 3,713,460
625.18 3,713,461
625.21 3,713,462

CLASS 138
89 3,713,463
CLASS 141
20 3,713,464
134 3,713,465
CLASS 144
2Z 3,713,467
CLASS 148
1.5 3,713,900
6.15R 3,713,903
6.15Z 3,713,902
6.16 3,713,904
6.3 3,713,901
31.5 3,713,906
3,713,907
36 3,713,905
126 3,713,898
175 3,713,908
179 3,713,909
186 3,713,910
187 3,713,911
3,713,912
3,713,913
CLASS 149
2 3,713,914
3,713,915
12 3,713,916
20 3,713,917
21 3,713,918
47 3,713,919
109 3,713,920
CLASS 150
83.3H 3,714,430
CLASS 156
2 3,713,921
16 3,713,922
62.6 3,713,927
66 3,713,923
78 3,713,925
98 3,713,926
123 3,713,928
127 3,713,929
147 3,713,930
148 3,713,931
167 3,713,924
173 3,713,932
176 3,713,933
180 3,713,934
231 3,713,935
242 3,713,936
245 3,713,937
246 3,713,938
248 3,713,939
250 3,713,940
251 3,713,941
252 3,713,942
255 3,713,943
261 3,713,944
278 3,713,945
293 3,713,946
3,713,947
351 3,713,948
363 3,713,949
401 3,713,950
497 3,713,952
498 3,713,951
548 3,713,954
552 3,713,955
580 3,713,956
CLASS 160
189 3,713,472
345 3,713,473
351 3,713,474
CLASS 161
14 3,713,957
18 3,713,958
59 3,713,959
66 3,713,960
93 3,713,961
154 3,713,962
173 3,713,964
254 3,713,965
CLASS 162
161 3,713,963
263 3,713,966
CLASS 164
26 3,713,475
52 3,713,476
69 3,713,477
85 3,713,478
89 3,713,479
CLASS 165
46 3,713,480
CLASS 166
55 3,713,481
59 3,713,482
117.5 3,713,483
3,713,484
224 3,713,485
250 3,713,486
280 3,713,487
285 3,713,488
292 3,713,489
305 3,713,490
CLASS 169
2R 3,713,491
3,713,492
31R 3,713,493
CLASS 170
220 3,714,511
CLASS 172
59 3,713,494
456 3,713,495
699 3,713,496
719 3,713,497
CLASS 173
53 3,713,498
CLASS 174
38 3,714,369
52S 3,714,370
126CP 3,714,371
CLASS 175
66 3,713,499
73 3,713,500
CLASS 176
5 3,713,967
37 3,713,968
38 3,713,969
45 3,713,970
50 3,713,971
60 3,713,972
78 3,713,973
3,713,974
79 3,713,975
CLASS 178
6.8 3,714,372
3,714,373
7.3D 3,714,374
CLASS 179
2E 3,714,375
15.55R 3,714,377
18AH 3,714,380
18B 3,714,378
18J 3,714,379
81A 3,714,381
100.2S 3,714,382
110B 3,714,376
CLASS 180
9.22 3,713,501
27 3,713,502
65R 3,713,503
3,713,504
79.1 3,713,505
82 3,713,506
127 3,713,507
CLASS 181
33GB 3,713,508
33K 3,713,509
CLASS 182
20 3,713,510
95 3,713,511
226 3,713,512
CLASS 184
6.16 3,713,513
CLASS 185
37 3,713,514
CLASS 187
8.41 3,713,515
CLASS 188
129 3,713,516
CLASS 192
18A 3,713,517
46 3,713,518
53D 3,713,519
58B 3,713,520
CLASS 193
37 3,713,521
CLASS 194
9T 3,713,522
CLASS 195
28R 3,713,976
29 3,713,977
31P 3,713,979
31R 3,713,978
32 3,713,980
62 3,713,981
63 3,713,982
82 3,713,984
103.5R 3,713,985
3,713,986
127 3,713,987
143 3,713,988
CLASS 196
66R 3,713,983
102 3,713,615
CLASS 197
19 3,713,523
84 3,713,524
181.2 3,713,525
CLASS 198
34 3,713,526
53 3,713,527
CLASS 200
44 3,714,383
51R 3,714,384
51.1 3,714,385
81R 3,714,386
168R 3,714,387
3,714,388
CLASS 202
173 3,713,989
185 3,713,990
CLASS 203
48 3,713,991
CLASS 204
1T 3,713,992
3,713,994
3,713,995
2 3,713,996
3 3,713,993
11 3,713,997
15 3,713,998
51 3,713,999
58 3,714,000
3,714,001
67 3,714,002
78 3,714,003
129.2 3,714,005
147 3,714,004
159.14 3,714,006
159.15 3,714,007
159.22 3,714,008
162HE 3,714,009
180P 3,714,010
181 3,714,011
192 3,714,013
195C 3,714,012
195P 3,714,015
195R 3,714,014
211 3,714,016
284 3,714,017
3,714,018
298 3,714,019
CLASS 206
1 3,713,528
16R 3,713,529
45.14 3,713,530
56DF 3,713,533
65E 3,713,532
80 3,713,534
CLASS 208
14 3,714,020
3,714,021
62 3,714,022
3,714,023
78 3,714,024
86 3,714,025
108 3,714,026
3,714,027
111 3,714,028
3,714,029
210 3,714,030
213 3,714,031
216 3,714,032
321 3,714,033
3,714,034
CLASS 209
80.5 3,713,535
273 3,713,536
307 3,713,537
CLASS 210
8 3,714,036
31C 3,714,035
42 3,714,037
59 3,714,038
60 3,714,039
138 3,713,538
164 3,713,539
170 3,713,542
196 3,713,543
235 3,714,524
391 3,713,540
415 3,713,541
CLASS 212
5 3,713,544
CLASS 213
43 3,713,546
CLASS 214
2.5 3,713,547
13 3,713,548
16.1A 3,713,549
17CB 3,713,551
3,713,552
27 3,713,550
85 3,713,553
147AS 3,713,554
339 3,713,555
621 3,713,556
763 3,713,557
CLASS 215
56 3,713,545
CLASS 219
104 3,714,389
121P 3,714,390
271 3,714,391
284 3,714,392
386 3,714,394
544 3,714,395
CLASS 220
3 3,713,559
15 3,713,560
CLASS 221
44 3,713,561
125 3,713,562
205 3,713,563
CLASS 222
1 3,713,564
20 3,713,558
180 3,713,565
CLASS 223
66 3,713,566
73 3,713,567
CLASS 224
6 3,713,568
CLASS 225
21 3,713,569
93.5 3,713,570
CLASS 226
2 3,713,571
7 3,713,572
CLASS 227
8 3,713,573
CLASS 228
3 3,713,574
6 3,713,575
CLASS 229
21 3,713,576
33 3,713,577
44M 3,713,578
44R 3,713,579
CLASS 231
2E 3,713,580
CLASS 232
1E 3,713,581
CLASS 235
61.11C 3,714,396
3,714,398
61.11E 3,714,397
92DM 3,714,393
114 3,714,399
116 3,713,582
117R 3,714,400
151.33 3,714,401
152 3,714,402
153AC 3,714,403
181 3,714,404
197 3,714,405
CLASS 239
17 3,713,583
206 3,713,584
307 3,713,585
326 3,713,586
383 3,713,587
400 3,713,588
575 3,713,589
590.3 3,713,591
597 3,713,590
CLASS 240
1EL 3,714,406
1.3 3,714,407
3,714,408
4.2 3,714,409
6.4R 3,714,410
6.45 3,714,411
7.55 3,714,412
9.5 3,714,413
10R 3,714,414
44.26 3,714,415
67 3,714,418
CLASS 241
17 3,713,592
27 3,713,593
46.08 3,713,594
46.11 3,713,595
99 3,713,596
134 3,713,597
260 3,713,469
CLASS 242
7.05B 3,713,598
7.11 3,713,599
58.4 3,713,600
68.6 3,713,601
74 3,713,602
107.2 3,713,603
118.2 3,713,604
157 3,713,605
184 3,713,606
510 3,714,354
CLASS 244
3.1 3,713,607
102R 3,713,608
110A 3,713,609
CLASS 246
63C 3,714,419
CLASS 248
1 3,713,610
19 3,713,620
44 3,713,611
49 3,713,613
183 3,713,612
205A 3,713,614
361R 3,713,616
371 3,713,617
417 3,713,618
425 3,713,619
CLASS 249
106 3,713,621
CLASS 250
42 3,714,420
49.5AE 3,714,417
49.5TE 3,714,416
49.5A 3,714,422
3,714,424
3,714,425
49.5R 3,714,423
51.5 3,714,426
59 3,714,428
61.5 3,714,427
3,714,429
83.3H 3,714,432
3,714,434
3,714,435
83.3R 3,714,431
83.6FT 3,714,433
105 3,714,436
199 3,714,437
3,714,438
201 3,714,439
206R 3,714,440
207 3,714,441
209 3,714,442
214P 3,714,443
218 3,714,444
3,714,445
219D 3,714,446
227 3,714,447
231SE 3,714,448
CLASS 251
10 3,713,622
150 3,713,623
CLASS 252
13 3,714,041
33.2 3,714,042
46.7 3,714,043
49.6 3,714,044
51.5A 3,714,045
51.5R 3,714,046
62 3,714,047
62.1 3,714,048
90 3,714,049
99 3,714,050
135 3,714,051
171 3,714,052
182 3,714,053
188.3 3,714,054
300 3,714,055
301.1R 3,714,058
3,714,060
301.1S 3,714,056
3,714,061
301.4F 3,714,059
301.4R 3,714,057
308 3,714,062
312 3,714,063
313S 3,714,064
316 3,714,065
358 3,714,068
389A 3,714,066
3,714,067
3,714,069
396 3,714,070
415 3,714,040
448 3,714,071
451 3,714,072
512 3,714,073
528 3,714,074
545 3,714,075
550 3,714,076
CLASS 256
32 3,713,624
3,713,625
CLASS 259
4 3,713,626
6 3,713,627
43.5MR 3,714,421
108 3,713,628
CLASS 260
2.5AH 3,714,080
2.5AQ 3,714,079
2.5BE 3,714,077
2.5FP 3,714,081
3,714,082
2.5HA 3,714,083
2.5L 3,714,078
9 3,714,084
17R 3,714,086
17.2 3,714,087
17.3 3,714,088
18S 3,714,089
21 3,714,090
3,714,091
22TN 3,714,092
28.5AV 3,714,094
29.2TN 3,714,095
29.4UA 3,714,096
29.6RB 3,714,097
3,714,103
29.6RW 3,714,098
3,714,101
29.6TA 3,714,099
3,714,100
3,714,106
29.6WA 3,714,105
29.6WB 3,714,104
29.6R 3,714,102
29.7SQ 3,714,107
30.4EP 3,714,112
31.4R 3,714,108
32.8SB 3,714,109
33.6AQ 3,714,110
37SB 3,714,204
38 3,714,111
39SB 3,714,085
40R 3,714,113
41B 3,714,114
41.5A 3,714,115
45.9R 3,714,116
3,714,117
46.5UA 3,714,118
46.5E 3,714,119
47EC 3,714,120
48 3,713,531
51.5 3,714,121
62N 3,714,267
62 3,714,122
63R 3,714,123
70M 3,714,124
75M 3,714,125
75R 3,714,126
77.5AM 3,714,127
77.5CH 3,714,128
78TF 3,714,129
3,714,131
78L 3,714,130
79 3,714,132
84.1 3,714,133
85.3R 3,714,134
86.7 3,714,135
89.7S 3,714,136
92.1 3,714,137
93.1 3,714,138
112.5 3,714,139
3,714,140
210E 3,714,142
210R 3,714,141
220 3,714,143
234R 3,714,144
239A 3,714,147
239D 3,714,148
239.1 3,714,146
3,714,150
239.3D 3,714,145
239.3T 3,714,149
240CA 3,714,151
240D 3,714,152
240R 3,714,153
243C 3,714,154
3,714,156
3,714,157
243R 3,714,155
247.1 3,714,159
247.5R 3,714,158
247.7C 3,714,160
3,714,161
249.8 3,714,162
251QA 3,714,093
251R 3,714,164
253 3,714,163
256.4N 3,714,165
256.5B 3,714,166
268C 3,714,167
283P 3,714,169
283S 3,714,170
286R 3,714,171
289R 3,714,168
294.8G 3,714,172
295AM 3,714,174
3,714,175
295R 3,714,173
305 3,714,177
307F 3,714,176
308R 3,714,178
309 3,714,179
309.2 3,714,180
309.6 3,714,181
310R 3,714,182
326C 3,714,189
326.11 3,714,187
326.45 3,714,188
326.3 3,714,183
3,714,184

326.5FN 3,714,185
326.5R 3,714,186
327TH 3,714,190
327B 3,714,191
330.5 3,714,193
333 3,714,192
3,714,201
335 3,714,194
340.7 3,714,202
340.9 3,714,195
3,714,196
343.3 3,714,203
346.1R 3,714,197
348A 3,714,198
350 3,714,199
3,714,200
380 3,714,205
397.4 3,714,207
3,714,208
397.7 3,714,206
3,714,209
412.8 3,714,210
438.5R 3,714,211
448.2E 3,714,212
3,714,213
448.8R 3,714,214
453PC 3,714,216
453R 3,714,215
3,714,217
454 3,714,218
463 3,714,219
464 3,714,220
465F 3,714,221
465.5A 3,714,223
465.5R 3,714,222
468C 3,714,224
468 3,714,336
473A 3,714,225
473S 3,714,226
3,714,227
476R 3,714,228
477 3,714,229
3,714,231
479C 3,714,233
479R 3,714,232
479S 3,714,230
486R 3,714,234
491 3,714,235
494 3,714,236
497A 3,714,237
513R 3,714,238
515A 3,714,239
517 3,714,240
519 3,714,241
3,714,242
523A 3,714,243
537P 3,714,244
543F 3,714,245
543P 3,714,246
556AR 3,714,247
557R 3,714,248
558R 3,714,249
559B 3,714,250
561K 3,714,251
562N 3,714,253
562R 3,714,252
564R 3,714,254
566A 3,714,255
567.6M 3,714,256
576 3,714,257
3,714,258
583NH 3,714,260
3,714,261
583P 3,714,259
586H 3,714,262
592 3,714,263
609F 3,714,264
611B 3,714,265
615B 3,714,266
621R 3,714,269
624R 3,714,268
632R 3,714,270
633 3,714,271
645 3,714,272
648F 3,714,273
649R 3,714,274
650F 3,714,275
3,714,276
650R 3,714,277
651R 3,714,278
666PY 3,714,279
668C 3,714,280
668D 3,714,281
673.5 3,714,282
675.5 3,714,283
677R 3,714,284
681 3,714,285
683.15D 3,714,286
826 3,714,287
827 3,714,288
830P 3,714,289
858 3,714,290
861 3,714,291
865 3,714,292
3,714,293
3,714,294
879 3,714,295
890 3,714,296
3,714,297
926 3,714,299
932 3,714,300
942 3,714,301
976 3,714,302
989 3,714,303

CLASS 261

23A 3,713,630
112 3,713,629

CLASS 263

6A 3,713,631
19R 3,713,632
33R 3,713,633

CLASS 264

.5 3,714,305
3D 3,714,306
45 3,714,308
49 3,714,307
89 3,714,309
3,714,310
94 3,714,304
98 3,714,311
108 3,714,312
117 3,714,313
137 3,714,314
210F 3,714,315
230 3,714,316
231 3,714,317
236 3,714,318
3,714,319
323 3,714,320
334 3,714,321

CLASS 266

21 3,713,634
23HH 3,713,635
23NN 3,713,636
23M 3,713,637
36P 3,713,638
38 3,713,639

CLASS 267

117 3,713,640
139 3,713,641

CLASS 270

31 3,713,642
61 3,713,643

CLASS 271

8 3,713,644
18R 3,713,645
57 3,713,646
58 3,713,647
79 3,713,648
3,713,649
87 3,713,650
89 3,713,651

CLASS 272

1R 3,713,652
57R 3,713,653

CLASS 273

26D 3,713,658
108 3,713,654
135AD 3,713,655
135R 3,713,656
190R 3,713,657

CLASS 277

95 3,713,659
206R 3,713,660

CLASS 280

11.35T 3,713,664
104.5R 3,713,661
106R 3,713,662
112R 3,713,663
124F 3,713,665
124R 3,713,666
150AB 3,713,667
150R 3,713,668
154.5R 3,713,669
168G 3,713,670
202 3,713,671
292 3,713,672

CLASS 281

3R 3,713,673

CLASS 282

13 3,713,674

CLASS 285

3 3,713,675

CLASS 287

53R 3,713,676
54C 3,713,677
189.36D 3,713,679
189.36 3,713,678

CLASS 289

17 3,713,680

CLASS 290

1 3,714,449
37 3,714,450

CLASS 292

78 3,713,681
80 3,713,682
336.3 3,713,683

CLASS 294

87.2 3,713,684
99R 3,713,685

CLASS 295

36R 3,713,686

CLASS 296

23R 3,713,687
107 3,713,688
137B 3,713,689
146 3,713,690
152 3,713,691

CLASS 297

384 3,713,695
385 3,713,692
389 3,713,693
390 3,713,694
452 3,713,696
456 3,713,697

CLASS 299

4 3,713,698
14 3,713,699
31 3,713,700

CLASS 300

904 3,713,216

CLASS 301

39R 3,713,701

CLASS 303

9 3,713,702
10 3,713,703
21B 3,713,704
21F 3,713,708
21P 3,713,705

CLASS 305

7 3,713,706

CLASS 307

3 3,714,451
39 3,714,453
86 3,714,452
109 3,714,454
112 3,714,455
117 3,714,456
120 3,714,458
141R 3,714,459
141 3,714,457
216 3,714,460
227 3,714,461
229 3,714,462
232 3,714,463
235R 3,714,465
235 3,714,464
237 3,714,466
240 3,714,467
252J 3,714,468
253 3,714,469
261 3,714,470
279 3,714,471
291 3,714,472
299 3,714,473

CLASS 308

8.2 3,713,707
36.1 3,713,709
137 3,713,710
187 3,713,711
215 3,713,712
235 3,713,713
237 3,713,714

CLASS 310

3 3,714,474
8.2 3,714,475
9.5 3,714,476
55 3,714,478
80 3,714,479
170 3,714,480
228 3,714,482
244 3,714,481
256 3,714,477
3,714,483
263 3,714,484

CLASS 312

45 3,713,715
107 3,713,716
195 3,713,717
263 3,713,718
352 3,713,719

CLASS 313

25 3,714,485
55 3,714,486
60 3,714,487
65R 3,714,488
69R 3,714,489
92R 3,714,490
96 3,714,491
108R 3,714,492
184 3,714,493
198 3,714,494

CLASS 314

27TD 3,714,503

CLASS 315

13C 3,714,495
18 3,714,496
19 3,714,497
3,714,498
22 3,714,499
24 3,714,500
3,714,501
30 3,714,502
31R 3,714,504
31 3,714,505
84.6 3,714,506
209CD 3,714,507
241 3,714,508

CLASS 317

5 3,714,509
11A 3,714,510
33VR 3,714,512
101DH 3,714,513
101C 3,714,514
104 3,714,516
118 3,714,515
123 3,714,517
139 3,714,518
141S 3,714,519
234R 3,714,520
3,714,521
235R 3,714,522
3,714,523
3,714,525
3,714,526
3,714,527
258 3,714,528
261 3,714,529
3,714,530
262A 3,714,531

CLASS 318

254 3,714,532
3,714,533
368 3,714,534
468 3,714,535
470 3,714,536
626 3,714,537

CLASS 321

1 3,714,538
1.5 3,714,539
2 3,714,540

CLASS 322

24 3,714,541
59 3,714,542

CLASS 323

4 3,714,543
6 3,714,544
3,714,545
8 3,714,546
22T 3,714,549
24 3,714,547
48 3,714,548

CLASS 324

.5R 3,714,550
3,714,551
3,714,552
3,714,553
16R 3,714,554
30B 3,714,555
34R 3,714,556
36 3,714,557
37 3,714,558
43R 3,714,559
61P 3,714,561
61 3,714,560
65R 3,714,562
67 3,714,563
71CP 3,714,564
3,714,565
77E 3,714,566
111 3,714,567
126 3,714,568
131 3,714,569
132 3,714,570
133 3,714,571
158F 3,714,572

CLASS 325

32 3,714,573
51 3,714,574
53 3,714,575
61 3,714,576
145 3,714,577
319 3,714,578
3,714,579
341 3,714,582
348 3,714,583
455 3,714,584
468 3,714,585
470 3,714,580
473 3,714,581
487 3,714,586

CLASS 328

41 3,714,587
155 3,714,589
158 3,714,590
162 3,714,591
167 3,714,588
233 3,714,592

CLASS 329

50 3,714,593
117 3,714,594
122 3,714,595
192 3,714,596

CLASS 330

14 3,714,597
19 3,714,599
25 3,714,600
29 3,714,598
3,714,601
86 3,714,602
109 3,714,603

CLASS 331

107A 3,714,604
107R 3,714,605
3,714,606

CLASS 332

7.51 3,714,607

CLASS 333

1.1 3,714,608
30R 3,714,609

CLASS 335

229 3,714,610
3,714,611
285 3,714,612

CLASS 337

295 3,714,613

CLASS 339

14R 3,714,614
112R 3,714,615
159R 3,714,616
186M 3,714,617
198R 3,714,618

CLASS 340

8S 3,714,619
15 3,714,620
15.5TC 3,714,621
16 3,714,622
18R 3,714,623
27R 3,714,624
32 3,714,625
38L 3,714,626
52H 3,714,627
64 3,714,628
146.1AL 3,714,629
146.3WD 3,714,631
3,714,632
146.3J 3,714,630
166R 3,714,633
172.5 3,714,634
3,714,635
3,714,636
173R 3,714,637
3,714,638
174TF 3,714,639
3,714,640
237S 3,714,641
263 3,714,642
274 3,714,643
3,714,644
347AD 3,714,645
412 3,714,646
416 3,714,647

CLASS 343

5DP 3,714,648
6.5LC 3,714,650
6.5R 3,714,649
9 3,714,651
16M 3,714,652
17.2PC 3,714,653
18E 3,714,654
100R 3,714,655
103 3,714,656
106R 3,714,657
3,714,658
701 3,714,659
757 3,714,660
858 3,714,661

CLASS 346

18 3,714,662
23 3,714,663
74ES 3,714,665
74M 3,714,664
3,714,666

CLASS 350

30 3,713,720
150 3,713,721
3,713,722
3,713,723
247 3,713,725
288 3,713,726
292 3,713,727
310 3,713,728
320 3,713,729
3,713,730
380 3,713,230

CLASS 351

113 3,713,731
153 3,713,732

CLASS 352

109 3,713,733

CLASS 355

3 3,713,734
11 3,713,735
15 3,713,736
45 3,713,737

CLASS 356

73 3,713,738
141 3,713,740
163 3,713,739
165 3,713,741
206 3,713,742
208 3,713,743

CLASS 359

216 3,713,724

CLASS 401

9 3,713,744
94 3,713,745

CLASS 408

8 3,713,746
115 3,713,747

CLASS 415

77 3,713,748
200 3,713,749

CLASS 416

20 3,713,750
87 3,713,751
219 3,713,752
226 3,713,753

CLASS 417

49 3,713,754
258 3,713,755
295 3,713,756
312 3,713,758

CLASS 418

71 3,713,759
133 3,713,757

CLASS 423

4 3,714,323
5 3,714,322
10 3,714,324
53 3,714,325
150 3,714,326
220 3,714,327
244 3,714,328
321 3,714,330
329 3,714,366
392 3,714,333
431 3,714,329
446 3,714,332
3,714,334
483 3,714,335
508 3,714,337
509 3,714,339
515 3,714,340
559 3,714,341
571 3,714,338
588 3,714,342
628 3,714,343

CLASS 424

1 3,714,344
3 3,714,345
47 3,714,346
115 3,714,347
117 3,714,348
149 3,714,349
203 3,714,350
226 3,714,351
243 3,714,352
3,714,353
244 3,714,355
267 3,714,357
270 3,714,358
271 3,714,356
311 3,714,359
317 3,714,360
320 3,714,361
324 3,714,362
326 3,714,363
3,714,364
330 3,714,365
333 3,714,367

CLASS 425

30R 3,713,764
59 3,713,760
109 3,713,761
197 3,713,762
308 3,713,763
366 3,714,331
384 3,713,765

CLASS 431

69 3,713,766

CLASS 444

1 3,714,667

D 6—	20	226,152	D09—	44	226,174			226,187			226,203			226,219
D06—	37	226,153		71	226,168		6	226,184			226,204		27	226,220
	69	226,154		116	226,169		24	226,188			226,205			226,221
	73	226,155			226,170			226,189			226,206		31	226,222
	91	226,156		216	226,175		30	226,190			226,207	D49—	30	226,223
	177	226,157			226,176	D22—	27	226,191		15	226,208		32	226,224
	190	226,158			226,177	D23—	2	226,192			226,209	D52—	4	226,225
D08—	51	226,159			226,178		5	226,196			226,210		6	226,226
	61	226,160			226,179		7	226,193			226,211		10	226,227
	81	226,162		253	226,171		19	226,194			226,212	D54—	8	226,228
	88	226,161		254	226,172		124	226,195	D35—	3	226,213			226,229
	131	226,163			226,180	D26—	5	226,197	D42—	1	226,214		12	226,230
	179	226,164	D13—	1	226,181			226,198	D44—	10	226,215			226,231
	220	226,165	D14—	3	226,182		14	226,199	D48—	16	226,216			226,232
	222	226,166			226,183	D28—	1	226,200		23	226,217	D56—	4	226,233
	232	226,167			226,185	D34—	5	226,201		24	226,218			226,234
	255	226,173			226,186			226,202						

D57—	1	226,235			
D61—		226,236			
		226,237			
		226,238			
D71—		226,239			
D73—		226,240			
D74—		226,241			
D81—	10	226,242			
D83—	1	226,243			
		226,244			
D86—	10	226,245			
		226,246			
		226,247			
		226,248			
	11	226,249			
D89—	1	226,250			

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama..... 1
Alaska..... 2
American Samoa..... 3
Arizona..... 4
Arkansas..... 5
California..... 6
Canal Zone..... 7
Colorado..... 8
Connecticut..... 9
Delaware..... 10
District of Columbia..... 11
Florida..... 12
Georgia..... 13
Guam..... 14
Hawaii..... 15
Idaho..... 16
Illinois..... 17
Indiana..... 18
Iowa..... 19
Kansas..... 20
Kentucky..... 21
Louisiana..... 22
Maine..... 23
Maryland..... 24
Massachusetts..... 25
Michigan..... 26
Minnesota..... 27
Mississippi..... 28
Missouri..... 29
Montana..... 30
Nebraska..... 31
Nevada..... 32
New Hampshire..... 33
New Jersey..... 34
New Mexico..... 35
New York..... 36
North Carolina..... 37
North Dakota..... 38
Ohio..... 39
Oklahoma..... 40
Oregon..... 41
Pennsylvania..... 42
Puerto Rico..... 43
Rhode Island..... 44
South Carolina..... 45
South Dakota..... 46
Tennessee..... 47
Texas..... 48
Rhode Island..... 49
Utah..... 50
Vermont..... 51
Virginia..... 52
Virgin Islands..... 53
Washington..... 54
West Virginia..... 55
Wisconsin..... 56
Wyoming..... 57
U.S. Air Force..... 58
U.S. Army..... 59
U.S. Navy..... 60

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,713,401	3,713,584	3,714,270	3,713,447	3,713,554	3,713,736
3,713,717	3,713,613	3,714,272	3,713,497	3,713,587	3,713,759
3,714,002	3,713,641	3,714,304	3,713,606	3,713,589	3,713,763
3,714,332	3,713,654	3,714,314	3,713,813	3,713,625	3,713,766
4 : 3,713,197	3,713,655	3,714,320	3,714,380	3,713,643	3,713,774
3,713,318	3,713,683	3,714,324	3,714,404	3,713,682	3,713,794
3,713,474	3,713,684	3,714,329	3,714,443	3,713,703	3,713,831
3,713,539	3,713,734	3,714,370	3,714,507	3,713,706	3,713,846
3,713,662	3,713,738	3,714,384	3,714,585	3,714,409	3,713,847
3,714,334	3,713,743	3,714,386	9 : 3,713,200	3,714,459	3,713,862
3,714,463	3,713,747	3,714,388	3,713,207	3,714,565	3,713,907
3,714,562	3,713,771	3,714,394	3,713,241	3,714,582	3,713,937
3,714,599	3,713,772	3,714,416	3,713,310	13 : 3,713,510	3,713,979
3,714,606	3,713,779	3,714,417	3,713,329	3,713,593	3,714,022
5 : 3,713,466	3,713,820	3,714,421	3,713,349	3,714,398	3,714,023
3,713,468	3,713,865	3,714,430	3,713,374	3,714,630	3,714,026
6 : 3,713,178	3,713,867	3,714,431	3,713,450	3,714,631	3,714,027
3,713,180	3,713,900	3,714,434	3,713,455	3,714,632	3,714,028
3,713,182	3,713,901	3,714,438	3,713,591	17 : 3,713,194	3,714,029
3,713,184	3,713,904	3,714,449	3,713,628	3,713,203	3,714,060
3,713,222	3,713,909	3,714,450	3,713,713	3,713,212	3,714,064
3,713,238	3,713,927	3,714,456	3,713,749	3,713,243	3,714,069
3,713,240	3,713,949	3,714,466	3,713,751	3,713,264	3,714,071
3,713,246	3,713,952	3,714,476	3,713,752	3,713,283	3,714,087
3,713,251	3,713,958	3,714,479	3,713,776	3,713,284	3,714,094
3,713,252	3,713,961	3,714,498	3,713,815	3,713,295	3,714,106
3,713,294	3,713,967	3,714,499	3,713,960	3,713,300	3,714,110
3,713,299	3,714,000	3,714,501	3,713,985	3,713,350	3,714,139
3,713,319	3,714,001	3,714,504	3,714,130	3,713,357	3,714,142
3,713,322	3,714,006	3,714,510	3,714,136	3,713,360	3,714,179
3,713,348	3,714,011	3,714,550	3,714,194	3,713,368	3,714,180
3,713,361	3,714,019	3,714,560	3,714,216	3,713,417	3,714,185
3,713,365	3,714,035	3,714,587	3,714,246	3,713,432	3,714,196
3,713,380	3,714,047	3,714,588	3,714,354	3,713,445	3,714,228
3,713,383	3,714,076	3,714,592	3,714,364	3,713,453	3,714,263
3,713,387	3,714,090	3,714,603	3,714,448	3,713,475	3,714,271
3,713,390	3,714,091	3,714,607	3,714,503	3,713,495	3,714,281
3,713,395	3,714,096	3,714,612	3,714,538	3,713,496	3,714,284
3,713,416	3,714,099	3,714,626	3,714,615	3,713,530	3,714,306
3,713,457	3,714,100	3,714,634	10 : 3,713,942	3,713,546	3,714,338
3,713,463	3,714,116	3,714,636	3,714,054	3,713,602	3,714,345
3,713,483	3,714,119	3,714,654	3,714,117	3,713,614	3,714,374
3,713,512	3,714,156	3,714,659	3,714,214	3,713,615	3,714,376
3,713,537	3,714,168	3,714,661	3,714,222	3,713,616	3,714,379
3,713,540	3,714,176	8 : 3,713,183	3,714,245	3,713,624	3,714,395
3,713,560	3,714,199	3,713,220	3,714,249	3,713,638	3,714,403
3,713,572	3,714,200	3,713,257	11 : 3,713,742	3,713,640	3,714,415
3,713,576	3,714,202	3,713,296	3,714,261	3,713,672	3,714,482
3,713,578	3,714,219	3,713,324	3,714,475	3,713,702	3,714,509
3,713,579	3,714,254	3,713,424	12 : 3,713,239	3,713,721	3,714,515
3,713,581	3,714,260	3,713,442	3,713,282	3,713,733	3,714,517

3,714,548
3,714,556
3,714,594
3,714,595
3,714,597
3,714,611
3,714,613
3,714,618
3,714,649
18 : 3,713,211
3,713,259
3,713,327
3,713,340
3,713,354
3,713,366
3,713,393
3,713,394
3,713,518
3,713,544
3,713,545
3,713,588
3,713,620
3,713,744
3,713,775
3,713,856
3,714,032
3,714,124
3,714,154
3,714,439
3,714,451
3,714,572
3,714,580
3,714,627
19 : 3,713,352
3,713,467
3,713,503
3,713,557
3,713,617
3,713,660
3,714,210
3,714,375
3,714,383
3,714,470
20 : 3,713,233
3,713,429
3,713,564
3,713,633
3,713,681
3,713,691
3,713,807
3,714,428
21 : 3,713,181
3,713,376
3,713,524
3,713,635
3,714,109
3,714,387
22 : 3,713,204
3,713,216
3,713,484
3,713,809
3,713,811
3,714,144
3,714,183
3,714,313
3,714,335
3,714,657
23 : 3,714,107
24 : 3,713,210
3,713,277
3,713,412
3,713,446
3,713,636
3,713,658
3,713,674
3,713,699
3,713,720
3,713,778
3,713,816
3,713,919
3,714,061
3,714,223
3,714,290
3,714,413
3,714,526
3,714,552
3,714,566
25 : 3,713,177
3,713,187
3,713,202
3,713,321
3,713,345
3,713,375
3,713,409
3,713,451
3,713,462
3,713,464
3,713,491
3,713,508
3,713,533
3,713,586
3,713,599
3,713,607
3,713,610
3,713,611
3,713,741

3,713,780
3,713,823
3,713,825
3,713,834
3,713,851
3,713,868
3,713,873
3,713,886
3,713,891
3,713,897
3,713,968
3,714,018
3,714,041
3,714,059
3,714,078
3,714,085
3,714,256
3,714,318
3,714,353
3,714,372
3,714,397
3,714,441
3,714,462
3,714,485
3,714,492
3,714,596
3,714,602
3,714,605
3,714,624
3,714,633
3,714,650
3,714,655
26 : 3,713,188
3,713,199
3,713,214
3,713,229
3,713,262
3,713,268
3,713,290
3,713,291
3,713,292
3,713,298
3,713,338
3,713,353
3,713,362
3,713,456
3,713,472
3,713,473
3,713,504
3,713,517
3,713,527
3,713,541
3,713,549
3,713,551
3,713,558
3,713,663
3,713,689
3,713,695
3,713,723
3,713,757
3,713,765
3,713,782
3,713,800
3,713,888
3,713,899
3,713,944
3,713,965
3,714,005
3,714,016
3,714,044
3,714,120
3,714,121
3,714,129
3,714,141
3,714,149
3,714,160
3,714,178
3,714,186
3,714,204
3,714,212
3,714,233
3,714,275
3,714,276
3,714,288
3,714,336
3,714,516
3,714,519
3,714,533
3,714,539
3,714,540
27 : 3,713,280
3,713,330
3,713,342
3,713,392
3,713,449
3,713,522
3,713,585
3,713,740
3,713,783
3,713,843
3,713,845
3,713,947
3,714,115
3,714,310
3,714,465
3,714,625

3,714,648
3,714,664
28 : 3,713,176
29 : 3,713,511
3,713,652
3,713,710
3,713,764
3,713,839
3,713,844
3,714,003
3,714,066
3,714,067
3,714,104
3,714,162
3,714,209
3,714,247
3,714,282
3,714,299
3,714,344
30 : 3,713,359
3,713,553
3,714,298
3,714,303
3,714,326
31 : 3,714,043
3,714,591
32 : 3,713,421
3,714,410
3,714,486
33 : 3,713,250
3,713,254
3,713,824
3,714,446
3,714,609
34 : 3,713,175
3,713,196
3,713,201
3,713,213
3,713,215
3,713,249
3,713,281
3,713,308
3,713,309
3,713,379
3,713,406
3,713,431
3,713,444
3,713,513
3,713,552
3,713,562
3,713,570
3,713,627
3,713,648
3,713,649
3,713,673
3,713,680
3,713,686
3,713,730
3,713,773
3,713,818
3,713,822
3,713,826
3,713,848
3,713,857
3,713,864
3,713,870
3,713,879
3,713,895
3,713,912
3,713,916
3,713,926
3,713,928
3,713,954
3,713,998
3,714,045
3,714,046
3,714,050
3,714,074
3,714,081
3,714,082
3,714,092
3,714,112
3,714,114
3,714,134
3,714,140
3,714,143
3,714,155
3,714,158
3,714,169
3,714,172
3,714,177
3,714,192
3,714,201
3,714,208
3,714,220
3,714,221
3,714,226
3,714,232
3,714,241
3,714,242
3,714,255
3,714,262
3,714,289
3,714,301
3,714,330
3,714,348

3,714,350
3,714,355
3,714,358
3,714,360
3,714,363
3,714,420
3,714,437
3,714,460
3,714,473
3,714,490
3,714,505
3,714,506
3,714,521
3,714,535
3,714,583
3,714,601
3,714,638
3,714,639
3,714,640
3,714,651
3,714,652
3,714,658
3,714,660
3,714,667
35 : 3,713,448
3,713,687
3,713,735
3,713,898
36 : Re.27,568
3,713,223
3,713,228
3,713,230
3,713,244
3,713,255
3,713,256
3,713,266
3,713,271
3,713,278
3,713,289
3,713,313
3,713,326
3,713,343
3,713,386
3,713,404
3,713,418
3,713,443
3,713,452
3,713,493
3,713,531
3,713,535
3,713,538
3,713,568
3,713,603
3,713,642
3,713,645
3,713,656
3,713,665
3,713,676
3,713,712
3,713,715
3,713,716
3,713,724
3,713,731
3,713,756
3,713,788
3,713,795
3,713,796
3,713,806
3,713,819
3,713,821
3,713,833
3,713,837
3,713,841
3,713,854
3,713,860
3,713,861
3,713,874
3,713,887
3,713,890
3,713,892
3,713,906
3,713,908
3,713,921
3,713,934
3,713,948
3,713,955
3,713,957
3,713,969
3,713,975
3,713,996
3,714,013
3,714,015
3,714,033
3,714,034
3,714,088
3,714,089
3,714,111
3,714,131
3,714,146
3,714,157
3,714,167
3,714,182
3,714,213
3,714,257
3,714,258
3,714,274

3,714,278
3,714,300
3,714,302
3,714,319
3,714,347
3,714,356
3,714,377
3,714,382
3,714,391
3,714,392
3,714,396
3,714,402
3,714,418
3,714,429
3,714,442
3,714,477
3,714,478
3,714,489
3,714,508
3,714,512
3,714,513
3,714,520
3,714,525
3,714,534
3,714,547
3,714,564
3,714,569
3,714,573
3,714,575
3,714,577
3,714,578
3,714,579
3,714,614
3,714,617
3,714,620
3,714,622
3,714,629
3,714,637
3,714,653
3,714,656
3,714,665
3,714,666
37 : 3,713,186
3,713,358
3,713,882
3,713,936
3,714,635
39 : 3,713,179
3,713,208
3,713,209
3,713,217
3,713,221
3,713,234
3,713,247
3,713,377
3,713,398
3,713,435
3,713,515
3,713,520
3,713,529
3,713,555
3,713,563
3,713,571
3,713,594
3,713,598
3,713,600
3,713,601
3,713,631
3,713,653
3,713,661
3,713,666
3,713,685
3,713,694
3,713,697
3,713,704
3,713,728
3,713,791
3,713,799
3,713,804
3,713,810
3,713,842
3,713,852
3,713,863
3,713,876
3,713,893
3,713,950
3,713,959
3,713,970
3,713,993
3,714,038
3,714,042
3,714,052
3,714,057
3,714,077
3,714,079
3,714,101
3,714,122
3,714,127
3,714,151
3,714,191
3,714,264
3,714,311
3,714,316
3,714,365
3,714,373
3,714,399

3,714,407
3,714,493
3,714,496
3,714,518
3,714,532
3,714,536
3,714,549
3,714,561
3,714,570
3,714,571
3,714,586
3,714,593
3,714,616
3,714,628
40 : 3,713,273
3,713,402
3,713,489
3,713,669
3,713,692
3,713,698
3,713,915
3,714,062
3,714,138
3,714,267
3,714,280
3,714,568
3,714,590
3,714,621
41 : 3,713,671
3,713,688
3,713,943
42 : 3,713,227
3,713,261
3,713,263
3,713,314
3,713,317
3,713,333
3,713,339
3,713,381
3,713,458
3,713,471
3,713,480
3,713,499
3,713,502
3,713,542
3,713,543
3,713,567
3,713,575
3,713,583
3,713,595
3,713,621
3,713,622
3,713,637
3,713,668
3,713,670
3,713,709
3,713,711
3,713,718
3,713,732
3,713,786
3,713,792
3,713,798
3,713,805
3,713,812
3,713,817
3,713,855
3,713,858
3,713,859
3,713,872
3,713,877
3,713,883
3,713,884
3,713,894
3,713,903
3,713,905
3,713,918
3,713,922
3,713,924
3,713,925
3,713,938
3,713,939
3,713,962
3,713,976
3,713,984
3,713,990
3,714,037
3,714,039
3,714,068
3,714,093
3,714,097
3,714,105
3,714,145
3,714,147
3,714,150
3,714,188
3,714,218
3,714,229
3,714,234
3,714,239
3,714,248
3,714,253
3,714,273
3,714,277
3,714,292
3,714,293
3,714,294

3,714,315
3,714,369
3,714,411
3,714,452
3,714,497
3,714,511
3,714,530
3,714,537
3,714,544
3,714,555
3,714,608
3,714,619
3,714,644
3,714,646
3,714,647
43 : 3,713,224
3,714,084
3,714,643
44 : 3,713,265
3,713,492
3,713,871
45 : 3,713,185
3,713,267
3,713,509
3,713,878
47 : 3,713,378
3,713,994
3,714,014
3,714,056
3,714,305
3,714,322
3,714,464
48 : 3,713,272
3,713,276
3,713,279
3,713,301
3,713,302
3,713,334
3,713,335
3,713,337
3,713,419
3,713,426
3,713,436
3,713,481
3,713,482
3,713,485
3,713,486
3,713,488
3,713,490
3,713,547
3,713,675
3,713,678
3,713,707
3,713,760
3,713,785
3,714,004
3,714,012
3,714,024
3,714,040
3,714,070
3,714,128
3,714,236
3,714,243
3,714,259
3,714,457
3,714,468
3,714,474
3,714,523
3,714,559
3,714,576
3,714,623
3,714,663
49 : 3,713,440
3,713,914
3,713,917
3,714,325
3,714,610
50 : 3,714,528
51 : 3,713,311
3,713,347
3,713,391
3,713,414
3,713,433
3,713,437
3,713,548
3,713,253
3,713,750
3,713,941
3,713,987
3,714,189
3,714,349
3,714,385
3,714,393
3,714,405
3,714,432
3,714,440
3,714,444
3,714,645
52 : 3,714,542
53 : 3,713,258
3,713,434
3,713,438
3,713,441
3,713,501
3,714,346
3,714,581
55 : 3,713,236
3,713,286
3,713,320
3,713,336
3,713,356
3,713,423
3,713,532
3,713,569
3,713,596
3,713,618
3,713,619
3,713,629
3,713,651
3,713,657
3,713,667
3,713,849
3,713,896
3,713,932
3,713,933
3,713,945
3,714,193
3,714,225
3,714,308

DESIGN PATENTS

4 : 226,203
6 : 226,164
226,165
226,167
226,181
226,182
226,184
226,191
226,196
226,197
226,200
226,204
226,205
226,207
226,211
226,212
226,224
226,225
226,246
8 : 226,237
10 : 226,170
12 : 226,156
226,169
226,192
13 : 226,172
226,206
17 : 226,155
226,157
226,171
226,175
226,176
226,177
226,178
226,179
226,193
226,242
226,249
226,250
20 : 226,195
22 : 226,210
24 : 226,190
226,198
25 : 226,159
226,168
26 : 226,152
226,153
226,163
226,188
226,226
27 : 226,223
29 : 226,161
226,243
32 : 226,216
34 : 226,202
226,222
226,227
226,232
36 : 226,160
226,173
226,174
226,180
226,208
226,209
226,213
226,219
226,230
226,231
226,236
226,241
226,247
37 : 226,217
39 : 226,158
226,166
226,228
226,229
226,235
41 : 226,245
42 : 226,162
226,185
226,186
226,187
47 : 226,201
55 : 226,194
226,240

U. S. GOVERNMENT PRINTING OFFICE : O - 1973

DESIGN PATENTS

U.S. DEPARTMENT OF COMMERCE
Peter G. Peterson, *Secretary*

PATENT OFFICE
Robert Gottschalk, *Commissioner*